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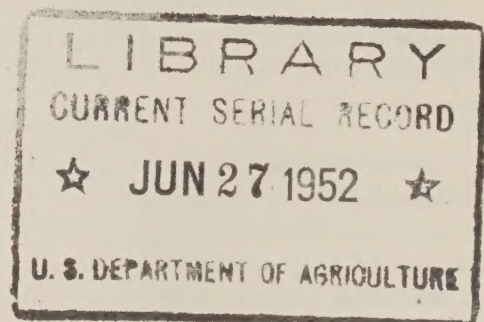
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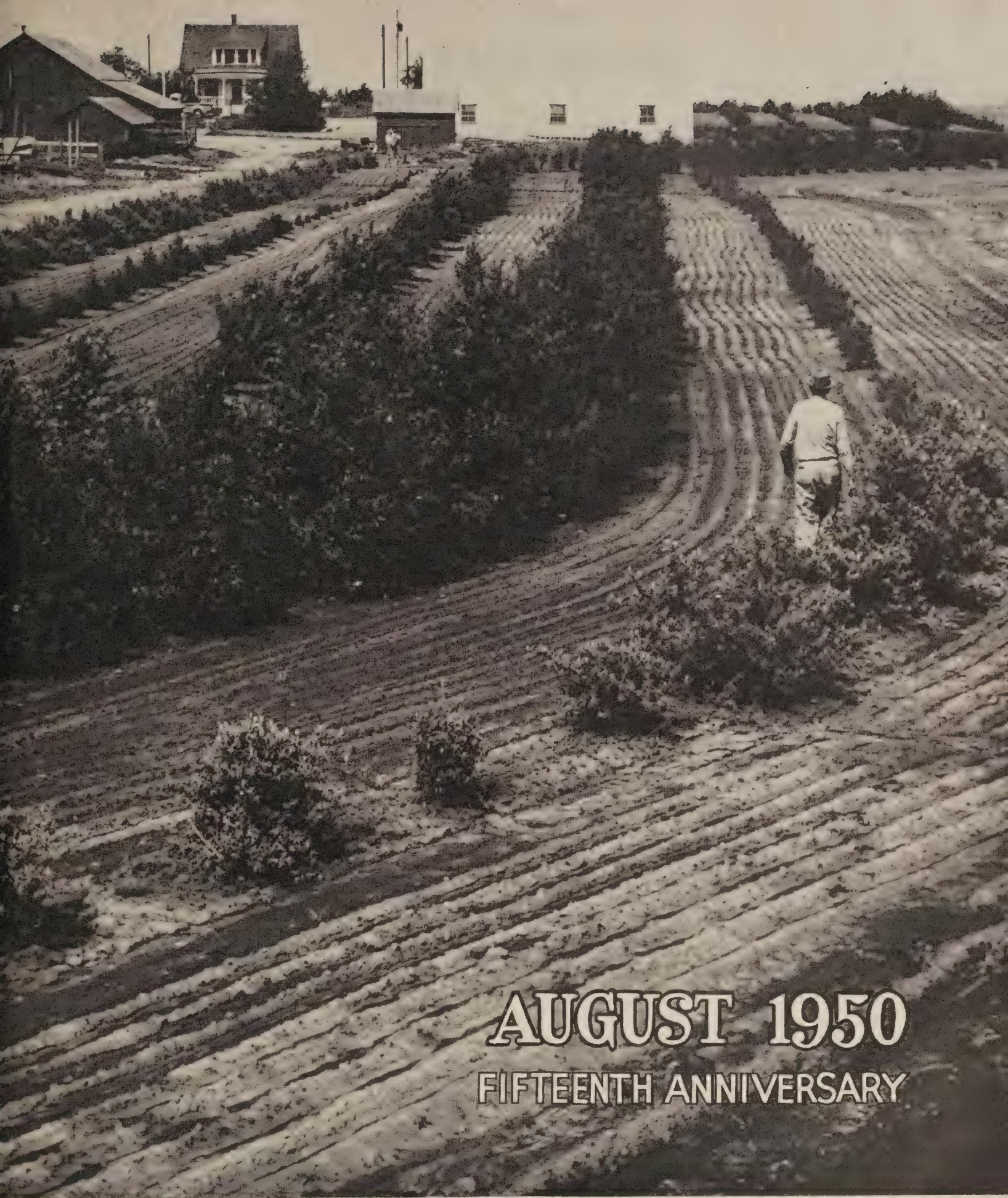
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AUGUST 1950
FIFTEENTH ANNIVERSARY

Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION•

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
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WELLINGTON BRINK

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Art Work by

W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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STORE VENEER LOGS IN FARM PONDS.—While flying over the Orangeburg Soil Conservation District of South Carolina recently, I noticed farm ponds which appeared to be cluttered with logs. Work Unit Conservationist J. B. Earle satisfied my inquiring mind by letting two local people tell the story.

T. R. Smith of the Limestone community told Earle: "A large gum tree fell in the water of my pond in 1932, and we couldn't get it out. Eighteen years later we pulled it out and found it to be just as sound as it was when it fell into the water. This gave us the idea to store veneer logs in ponds. During certain seasons logging is not possible because of the flooded swamps or bad weather.

"To have logs stored for use during this period prevents a stoppage at the veneer plant. The logs are submerged immediately after cutting and are kept in water continuously until used. Just a reserve of the logs is stored, however; most of them are taken directly to the plant. The pond is constructed to permit the lowering and raising of water quickly to facilitate the placing of logs in the water and removing them when needed."

B. P. Adams, manager of the U. S. Plywood Corp. plant in Orangeburg gave this information:

(Continued on page 16)



FRONT COVER.—The photograph by B. C. McLean is of a 5-row farmstead windbreak 2 miles east of Trenton, Nebr., planted in the spring of 1947. The windbreak follows the contour of the terrace and will serve as protection to a feed lot on the south. Cultivation with a duckfoot and spring-tooth harrow are partly responsible for the rapid growth.

A FEW REMARKS

ON REACHING A MILEPOST

By WELLINGTON BRINK

THIS is our fifteenth anniversary. The first issue of SOIL CONSERVATION Magazine appeared August 1935. There was little then to indicate the sweeping, historic dimensions of the land revolution ahead.

Yet, through these columns, across these pages, piecemeal but endlessly, has moved a stirring drama of agricultural renaissance. Within our time in print, spectacular changes have come to the face of America. We have watched a scene without parallel or precedent in all the centuries of shameful exploitation since man first scratched a furrow to plant a seed. Month by month, through this crowded decade and a half, we have witnessed new knowledge and wisdom emerging and being put to use for crops and ranges. We have reported new plants, new machinery, new implements, new methods, new strategy, developed and applied to the protection of the soil, to the increasing of its returns, to the building of security and hope for all men. We have noted happily first the birth, then the amazing growth in number and versatility and accomplishments of soil conservation districts, those prime examples of crossroads democracy.

Our story has been—is—as much of people as of land. It is a story of *great* people, *great* land, overcoming the wounds of drought and depression, and achieving victory in World War II. It is a story of postwar readjustment; of resolute use of conservation measures to supply the democratic world with materials it needs to stay democratic.

Here, in SOIL CONSERVATION Magazine, is provided a forum, a common ground, where we may sift and suggest, and try out ideas, where we may trade information and share problems. For a very long time this was the only publication devoted wholly to soil conservation. Contributors—generous and selfless—have given to these pages a pioneering quality, a devotion, a substance, a color, a sparkle, fairly unique, I think, among

specialized journals. Together, using this medium, our leaders and contributors—technicians, State executives, civic leaders, farmers, bankers, lawyers, ministers, club officials, university presidents, teachers, and all the rest—have helped to educate each other. Through their writings, they have helped to establish and refine the new profession and science of soil conservation. They have as graciously welcomed to their circle the junior engineer as the man already distinguished in letters or scholarship or scientific attainment. Always there has been room for the one with something to say worth saying. Two or three writers of national prominence first tried their wares on the readers of SOIL CONSERVATION Magazine. Innumerable others have enjoyed the satisfaction of seeing their writings move out of type and into practical application on farms from coast to coast.

The districts, after the first few years, quite properly took over major headlines, preferred positions. They also made the space in these columns more valuable as the shorter items—the “Notes from the Districts”—began to command eager attention. Each such item contained a worth-while nugget practical elsewhere because it already had been tried and proved.

Veteran readers will recall names, articles, phrases, slogans, even photographs.

Remember?

“The flag is on the plow.”

“Total conservation.”

“Selective service for every acre.”

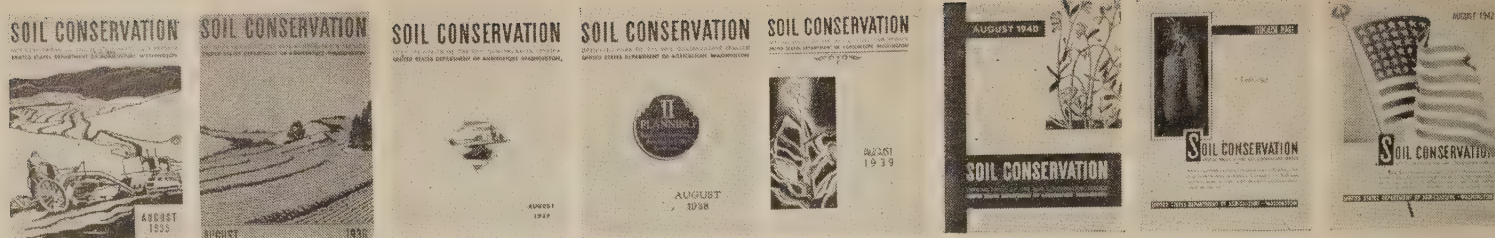
“Districts ride the range.”

“Democracy in land use.”

“Consider the farmer as well as the farm.”

“The practical soil conservationist talks with a stem of timothy in his mouth.”

Colorful expression has seemed to come natural to many of our writers, their output having the easy flow of clear, unpolluted waters and the rich mellowness of leafmold. Their daring has equaled their facility, and they have never hesitated to introduce to you and me such fearsome



The front cover at extreme left introduced Vol. I, No. 1—August 1935. Covers for August, 1936 to 1942, follow.

but useful words as “ecology,” and to repeat their brashness until the words and the public have become fast friends.

Thousands upon thousands of photographs more recently have been made of the impact of a raindrop on the soil, but it was way back in 1939 that SOIL CONSERVATION Magazine pioneered with pictures of this phenomenon taken at $\frac{1}{1100}$ of a second by stroboscopic camera at the Massachusetts Institute of Technology.

All parts of the United States, all phases of the soil conservation program, have been represented in picture and text. The cover photographs, and many of the illustrations, often widely remarked upon and put to many subsequent uses, have come from the regular files of the Soil Conservation Service—the work of both professionals and amateurs.

From time to time it has seemed well to get out a special issue, and the series has included such subjects as program, planning, pasture management, engineering, wildlife, foreign soil conservation, vegetation for soil conservation, upstream engineering, Puerto Rico (translated into Spanish), the educational approach, water, and, of course, districts.

Among our district profiles have been A. Threlkeld, Kentucky; Kent Leavitt, New York; Guy A. Leader, Pennsylvania; J. F. Sievers, Massachusetts; Dennis Getchell, Maine; Bob Rutter, Washington; Alfred Wiger, Minnesota; Frank Gyberg, Arizona; Parley P. Smith, Utah; Albert N. Chamness, California; Lloyd Arbuckle, Indiana; Wade E. Eller, North Carolina; J. W. Cornwall, Washington; E. S. Gardner, Utah; Ernest Ritter, Massachusetts; J. Hawley Poole, North Carolina; Silas L. Wright, Idaho; Waters S. Davis, Jr., Texas; and R. B. Webb, Washington. And yet, the “profiles” have contained but a fraction of the total population of our pages.

We have had names well known to book fans: Bromfield, Waring, Forman, Fink, Davison, Van

Dersal, Graham, Sears, McDonald, Waksman, and others. Way back in one of our early years, with some trepidation because of the departure from usual Government practice, we ran two pages of reproductions of Dust Bowl paintings by Alexander Hogue, whose fame was to come later when his work was honored in the leading galleries of Europe and America. We have had governors, cabinet officers, editors, bankers, college presidents, railroad executives, leaders of organized business and organized labor, and—outstandingly, the final authorities—farmers. No house organ, this, in the usual sense. Our magazine has tried to serve as a journalistic town meeting for free discussion of the whole soil conservation theme.

Yes, it has taken a small army of writers—perhaps 800 or more—to make this magazine, to keep our readers abreast of the rapid happenings on the land. And if the magazine has been satisfactory it is because of this able and enthusiastic volunteer “staff” of contributors rather than the one or two editors who have pieced the material together each month.

As for the *next* 15 years: We shall try to step lively—and it will take alert publishing to keep up with the rapid happenings out there on the countryside.

I have thought it appropriate to request an article for this issue from Hugh Hammond Bennett, the one person best equipped to provide a perspective of the past, present, and future of the soil conservation movement. I need hardly remind our readers that it was Hugh Bennett’s voice, his science, his dynamic leadership, and his organizational force that is largely responsible for the conservation era in American agriculture.

I asked the Chief to dig a bit into history, to put on paper some of his personal recollections of his long fight for official recognition of the soil erosion problem and his subsequent struggles for a national soil conservation program. This he has done with his usual care, and I commend his article to every thoughtful man and woman.



The march of front covers continues. These August designs are for the period from 1943 to 1950, inclusive.

But a word about the man himself—

Hugh Bennett today is the preeminent world figure, the acknowledged final authority, in the field of soil conservation . . .

He it was, with a few associates, who first discovered the significance of sheet erosion in 1905 . . .

Pounded home to the Nation the appalling erosion situation during the period of his work on the land, 1903 to 1929 . . .

Presented testimony to Congress that resulted in the first Federal appropriation for erosion studies in 1928 . . .

Selected, with his associates, the sites of 10 erosion research stations, then directed the work that developed (a) the world's principal quantitative data on erosion processes and rates, and (b) the principal erosion control measures, in 1929 . . .

Outlined a program for national soil conservation, 1930, and again in 1933, when the Soil Erosion Service was established with Bennett as director . . .

Presented testimony to Congress that led in 1935 to the first soil conservation act in the history of this Nation, and to the establishment of the Soil Conservation Service as a permanent agency of the Department of Agriculture.

From the very beginning Hugh Bennett has guided the Soil Conservation Service: A strict taskmaster—a perfectionist—who nevertheless, by his appreciation of good work on the part of his team, commands a rare brand of loyalty and affection.

SOIL CONSERVATION Magazine is proud to present in this issue its favorite contributor, a man of prodigious authorship, whose works include five books and more than a thousand scientific and popular articles or bulletins on soils, soil erosion, agriculture, and soil conservation . . . a man known to millions, also, as a compelling speaker . . . whose manner on page or platform is humble and genuine.

He was telling me as I went to press a story from the Imperial Valley of California, which illustrates his very special pride in the fact that soil conservation more than pays its way. I think you'd like to have this story, too, just as he told it to me:

In 1940 some people of the Valley came to Washington and told me about their grave problem of poor drainage and salt accumulation. The Service began research activities to determine what might be done to improve the situation.

Our division of irrigation began work, in cooperation with the Imperial Irrigation District, in 1941, looking first to better methods of drainage. Old methods had failed, and our investigators found out why.

First, an underground survey of soil conditions was made down to depths of 9 to 12 feet. This revealed the presence and location of impervious clay lenses, characterized by poor drainage, salty condition, and poor crops or no crops at all, on the upper side of the clay barriers.

Studies of underground water movement were made by the use of new techniques devised by the Service, and a new system of drainage was developed, called the barrier system. This was put into field use after 5 years of research through our division of operations.

Some of the basic elements of the new system are to install tile drains so as either to avoid the impervious lenses of clay or go through them at the narrowest points.

In 1947, 325 miles of tile drains were installed on nearly 20,000 acres. This resulted in outstanding improvement, so much so that in 1948 about 50,000 acres that had produced little or nothing were restored to successful cultivation. Since then the area improved has gone up to approximately 90,000 acres. *Last year (1949) the increase in the value of crops in Imperial Valley was reported at around \$24,000,000.* This was largely due to improved soil conditions resulting from the research and operational work of the Soil Conservation Service.

SCHOOL GAINS.—Vermont reports three new developments in conservation education: (1) The State Department of Education is developing a bulletin on conservation education for use by public school teachers throughout the State; (2) the University of Vermont is offering a conservation workshop at its 1950 summer school, attended mostly by teachers; and (3) State 4-H Clubs will have a State-wide conservation camp at Downer State Forest October 12 to 14.

The *FUTURE* of OUR AMERICAN LAND

By H. H. BENNETT

THIS fifteenth anniversary of SOIL CONSERVATION Magazine provides an appropriate occasion to review some of the events of the past, take stock of where we stand today, and set forth my ideas about the future course of soil conservation in the United States.

Few people, I believe, realize how much progress the country has made in soil conservation. It has been remarkable, even though we would like to see it go faster. I can see it from something of a vantage point, for I have been working with the land for the last 47 years and most of that time has been spent on problems of safeguarding the land and keeping it permanently productive. This is a period covering more than one-fourth of the life of the Nation. In this time more has been done for conservation and prudent use of soil and water resources than ever before in world history. Indeed, it has been within the past 17 years, when we embarked on a national program of soil conservation, that most of the progress has been recorded.

Today I believe there is more reason for assurance about the future security of our productive land than ever before. The fundamental principles as well as the technology of successful soil and water conservation—as now being used and fostered by the Soil Conservation Service—have been well developed. Economically, the value of high quality soil conservation work has been demonstrated over and over again as a paying, dollar-and-cents advantage to landowners, tenants, and the Nation. Socially, the human and governmental machinery for accomplishing wide-scale conservation of soil and water resources without recourse to controls and directives has been successfully tested and developed in soil conservation districts.

Regular readers of this magazine have been able to follow, month by month, the progress of our technology, the mounting evidence of the economic value of sound soil conservation work, and the



rapid development, since 1937, of soil conservation districts; today there are more than 2,200 districts in every State and Territory of the Nation, including more than three-fourths of all the farms and ranches in the country.

There has been a considerable background to all this progress, however, and I have had a personal part in much of it. Four decades ago, in describing the Orangeburg sandy loam, I wrote in the report on the soil survey of Lauderdale County, Miss. (Field Operations, U. S. Bureau of Soils, 1910) :

Unfortunately, the type is peculiarly susceptible to ruinous erosion under the conditions of rolling topography obtaining in the area, particularly the southwestern third of the county. If the gentler slopes are not terraced and the steep situations kept in timber, deep gorgelike gullies or "caves" gradually encroach upon cultivated fields, eventually bringing about a topographic condition too broken for other than patchy cultivation. In the steeper situations these gullies have eaten out canyonlike hollows, even through timbered areas, until the Orangeburg sandy loam occurs in many places as narrow, tonguelike ridges reaching out from the higher elevations in all directions. Bridges placed over the heads of these deep gullies are of very common occurrence along the ridge roads. Frequently the gullies, advancing from opposite directions, have completely cut across high ridges, necessitating the construction of bridges. The gullies often have perpendicular walls, sometimes 25 to 50 feet or more in height.

With each heavy rain great masses of soil cave into the gullies from their heads in perpendicular chunks sometimes 10 or 15 feet thick. . . . To check this ruinous erosion slopes must be terraced, seeded to Bermuda-grass, and even planted to trees or rapidly growing and fast-holding plants like honeysuckle. The best way of handling erosion in the case of the Orangeburg soils is to begin, before deep gullies have been cut, to terrace and incorporate vegetable matter. In many of the gullies the advancement can be checked by cutting down the sides so as to get a slope on which to start Bermuda-grass, lespedeza, honeysuckle, or willows, which are good soil binders.

Five years before writing this report, W. E. McLendon and I had discovered the deadly significance of uncontrolled sheet erosion in Louisa

County, Va., where we had been making a soil survey. The facts were duly reported to headquarters, but obviously they failed to impress the authorities, because only a few years later the chief of the bureau wrote:

The soil is the one indestructible, immutable asset that the Nation possesses. It is the one resource that cannot be exhausted; that cannot be used up. (Soils of the United States, USDA, Bur. of Soils, Bull. No. 55, 1909).

At the time, this statement of the chief of the Nation's soils bureau seemed to me to spell the end of all promise of arousing the people of the country to the fact that the very base of their national strength and individual welfare—their productive land—was in grave danger.

I had hoped that we might attract some attention to the danger inherent in continued, uncontrolled erosion by setting forth fact on fact in the soil survey reports we were writing, but these reports were not widely read and actually we had a small audience through this medium. In the soil survey report of Fairfield County, S. C., for example, we reported the astounding fact that in this relatively small county some 136,000 acres of formerly cultivated land had been ruined for further immediate cultivation, with most of the other farmed land suffering from erosion. Nobody paid any attention. It became painfully evident, to me, that much more would have to be done to arouse any extensive interest in the problem.

Opportunities for effective public presentation of the case were limited, to say the least. Even so, one could only plug away, and in 1921 I was still trying to get a response from an audience. That year, in a paper dealing with "Classification of Forest and Farm Lands in the Southern States," presented before the Third Southern Forestry Congress, I said:

Going now from the Piedmont down into the Coastal Plains region, we find in the higher upper and middle parts of that region, frequent small and large belts of land too rolling and rough . . . for farm use, yet pro-

ducing good pine timber. Some of this was formerly cultivated, then abandoned owing to the gullying effects of erosion. The practical abandonment of approximately 25 percent of the area of a single county in west central Georgia is a conspicuous example. One-half of this was classified by a soil survey as rough gullied land and the other half as dense, impervious refractory clay . . . Erosion has so gullied the greater part of this type that there is practically no level land . . . and much of it cannot be profitably farmed.

The rough character of this land, which prohibits tillage operations over much of it, is the result mainly of the erosion that has taken place since the land was cleared for cultivation. . . . There are today on this type many

deserted but substantial farmhouses, abandonment of which was compelled by the ruining of the fields by erosion.

Land of this type is best suited for use as pasture and for forestry. Most of the areas support a second growth of shortleaf pine, although there are many abandoned treeless fields covered with broomsedge.

. . . Some areas are available for pasture, but a considerable total area is not even suitable for this use, as there are many deep gullies with steep or perpendicular sides on which no vegetation can find a footing. Except where some measure is taken to check the progress of the gullies, they extend with destructive effect at a rapid rate. Establishing tree growth in the bottoms of the gullies and thus forming a bulwark for filling in the heads . . . has been found the most effective method of resisting their encroachment upon the cultivated area.



Hugh Hammond Bennett.

This analysis of the land-use adaptability of 95 million acres, printed and distributed in the proceedings of the conference, met with no discernible response on the part of the public. And various other papers and articles dealing with the pressing need for soil conservation received very little attention. I have often wondered how many people read conference proceedings.

Finally, however, in 1928, I began to have a change in luck. That year, with the publication of *Soil Erosion a National Menace* (USDA, Circular No. 33), the public began to take some notice. This well-illustrated publication seemed to strike home. Newspapers and people began to recognize the existence of an erosion problem and to ask what might be done about it. I think the state-

ment that caused the greatest concern was the following, from page 5:

The amount of plant food in this minimum estimate of soil wastage by erosion (1,500,000,000 tons of solid matter annually) amounts to about 126,000,000,000 pounds, on the basis of the average composition of the soils of the country as computed from chemical analyses of 389 samples of surface soil collected by the Bureau of Soils (1.55 percent potash, 0.15 percent phosphoric acid, 0.10 percent nitrogen, 1.56 percent lime, and 0.84 percent magnesia). This is more than 21 times the annual net loss due to crops removed (5,900,000,000 pounds, according to the National Industrial Conference Board). The amount of phosphoric acid, nitrogen, and potash alone in this annually removed soil material equals 54,000,000,000 pounds. Not all of this wasted plant food is immediately available, of course; but it comes principally from the soil layer, the main feeding reservoir of plants, and for this and for other reasons it is justifiable, doubtless, to consider the bulk of it as essentially representing lost plant food, without any quibbling about part of it having potential value only.

From this point on, interest increased steadily. However, it was not entirely spontaneous. I had assumed as a part of my official duty the job of spreading all the reliable information I could get my hands on as far and wide as possible. Receiving no orders to apply the brakes, I made another assumption: that no orders to slow down meant full authority to speed up. I did speed up—and in all directions. There was no word or criticism from any source. On the other hand, I was asked to go here and there about the country to talk about erosion and conservation. I was asked, for example, to speak at Pennsylvania State College. The subject was “Do We Have an Erosion Problem in Pennsylvania?”

I was surprised by the subject assigned—that they were unaware of the problem. I learned that some of those in the audience were surprised, too, but for a different reason. They had not known, before, that erosion had invaded the Keystone State.

In 1927, Howard E. Middleton and I made a very general reconnaissance of erosion conditions in those parts of the United States about which we had little information. I had discovered even before this time that if anything effective was going to be done about controlling erosion, some few individuals would have to spearhead the movement. I mixed in on this part of the job. One thing that seemed absolutely necessary was to get the Federal Government solidly behind a soil and

water conservation movement. Congressman James P. Buchanan of Texas helped make the start. As a member of the Subcommittee on Appropriations for Agriculture in the House, he became interested in getting a Nation-wide program of soil conservation research under way. A. B. Conner, director of the Texas Agricultural Experiment Station had stimulated the Congressman in this interest and on December 18, 1928, Congressman Buchanan called me to present testimony on the subject from a Nation-wide standpoint.

An appropriation was made; and subsequently I was put in general charge of the soil erosion research work in the old Bureau of Chemistry and Soils. Six erosion research stations were established with the first appropriation and four others with funds made available later.

Establishment of the erosion research stations in strategically located areas of the country marked the real beginning of the national program of soil and water conservation. They were the first stations of their kind in the history of the world, as far as I have been able to determine, and they began to produce results promptly.

Thousands of measurements of soil and water losses under different conditions of land, climate, and agriculture were made. This newly acquired information was made public as widely and as quickly as possible. Nothing was buried in bulletins or in the files that could be put to immediate use. Simultaneously there came an upsurge of new ideas and new concepts with respect to the wasteful process of erosion. For my own part, I learned that I had been conservative. Estimates I had made with respect to erosion rates, the removal of soil from fields, and water lost as wasted runoff were shown to be underestimates in practically every instance.

So it was that I had to revise my ideas about the enormity of the soil erosion problem. It was a greater problem, and the time was later, than I had believed.

We not only studied the processes and rates of erosion and water losses from different land conditions under a great variety of treatments, but we carried on numerous investigations with respect to control and prevention.

Later, we discovered that this information was strictly new, not only for the United States but for the world. Careful scrutiny of the literature

revealed nothing in the nature of a similar scientific study of erosion. So the basic information was largely developed, at least at this stage, here in the United States on these erosion research stations. Scientists and others over the world asked for the information and it was given them freely from the very start.

Public interest in erosion was vastly accelerated by this work—so much so that in 1933 a national program of soil conservation was started with an allotment of 5 million dollars of relief funds, under authority of the National Industrial Recovery Act. In the beginning the principal job was to find men who had had any technical experience in soil conservation work. This was not easy. I had found out, in developing a staff for the research stations, that at the time they got into operation there were probably not more than about 50 men in the United States who really understood the meaning of sheet erosion. In the intervening years, some additional men had been trained. So we naturally turned to these stations for whatever help we could get. Then we recruited our staff from experienced agriculturists, who were put to work under our most experienced men. Later, within the Service, we operated training schools for expansion of the Service staff.

Farmers liked the work from the very beginning. After a few months of field experience, we were given additional funds for the program. And later, still more funds. We made some mistakes, to be sure, but our successes vastly outnumbered them. We learned from our mistakes and in addition we intensified our research program. Moreover, we asked the plant specialists to bring into our conservation nurseries every plant in the country that appeared to have any promise for fitting into any particular useful niche in the soil conservation program.

Out of this nursery and research work, along with our farm experience in soil and water conservation, we steadily refined and improved the program with every additional bit of information and every new plant that proved worth while. Work moved along so rapidly from the research stage into the operational stage that some people became confused about the real sequence of events. There were those who thought the dust storms, current at that time, were responsible for starting

the big soil conservation effort. The dust storms helped to stimulate interest in the program, to be sure, but the program had been going nearly 8 months when the first great duster of May 12, 1934, blew across the country from the heart of the Nation to blot out the sun over the Capitol at Washington.

Then the Seventy-fourth Congress took us in hand, and set us up under the first soil conservation act ever passed by any great Nation that we know anything about. This was the Soil Conservation Act of April 27, 1935, Public No. 46, Seventy-fourth Congress, which reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it is hereby recognized that the wastage of soil and moisture resources on farm, grazing, and forest lands of the Nation, resulting from soil erosion, is a menace to the national welfare and that it is hereby declared to be the policy of Congress to provide permanently for the control and prevention of soil erosion and thereby to preserve natural resources, control floods, prevent impairment of reservoirs, and maintain the navigability of rivers and harbors, protect public health. . . .

This act established the Soil Conservation Service as a permanent agency in the Department of Agriculture.

Since then, through the drought and depression of the 1930's and the war and postwar periods of the 1940's, the soil conservation movement and the program of the Soil Conservation Service have made steady progress. Over and over again, under a wide variety of circumstances and needs, the usefulness and value of scientific soil and water conservation work has been proved. In dry years, it helped conservation farmers store water in the soil to bring their crops through drought to harvest in good condition. In exceptionally wet periods, it has demonstrated its effectiveness in slowing down rapid and wasteful—sometimes ruinous—runoff of water that would have contributed to flood peaks. In times of crop surpluses, it has provided the farmer with a sound basis for making desirable changes in his production, often toward greater diversification, and with a reduction in the per acre cost of production. This kind of modern soil conservation work has meant better net income per acre to thousands of conservation farmers and also better net income per farm. In times of need for greater volume of production, as during the war, soil conservation work proved its effectiveness again. By using land more effi-

ciently and by preventing erosion and needless loss of water, fertilizer, and seed, conservation farmers were able to increase production per acre and per farm. Nation-wide, conservation farmers were able to increase their production by a third or more on the average, and many individual farmers were able to accomplish 50, 75, and even 100 percent increases in volume.



There is no joy of living here. Soil conservation goes far beyond mere mechanics; it proceeds in harmony with the whole meshwork of natural laws. And the ultimate benefit reaches beyond crops to the people themselves.

In the 1930's and even into the early 1940's, we were obliged to devote a considerable amount of time to educational work, preparatory to actual conservation work on the land. This was a slow but necessary activity, and it served to hold down the annual rate at which conservation measures were being applied. It did not mean, however, that conservation progress was slow. The education of farmers and ranchers in the forms and consequences of uncontrolled erosion, as well as in the practical means available to achieve permanent conservation, are vital preliminaries to actual work on the land. Without such understanding on the part of the landowners, conservation measures would not be properly applied and certainly they would not be properly maintained.

In different words, I am saying that the number of farm plans prepared, the number of acres terraced, and the number of farm ponds built are not the only gage of conservation progress. Ac-

tual work on the land is only one part of what is necessary to bring about and sustain the conservation of land and water resources. Not the least of several other essential elements in successful, lasting conservation is the persistent, patient work to help farmers, ranchers, and others understand with some clarity what conservation farming is, why it is necessary, and what is required to start

it and keep it going on a sound basis. And inasmuch as this type of work has required changes in traditional habits of thinking and doing things as well as the somewhat delicate task of readjusting some social customs, it was—and is—probably the most difficult part of getting a national soil conservation program under way.

All the conservation science in the world will not get one acre of privately owned land in this country protected against erosion, drained of excess water, or used in accordance with its physical capability unless the landowner wants it done and knows why he wants it done.

So in measuring what has been accomplished to date, the educational work we have done ranks near the top of the list. And in fairness to the Soil Conservation Service and its men who were largely untrained in this field, it must be noted that for years they carried on with little or no help, as a general rule. I can remember clearly



This lad looks out upon a happy future—a land productive, safe, and beautiful.

some venerable individuals who contended, in the face of thousands of acres of gullies in their States, that erosion was no problem within their boundaries. There were others who would have nothing to do with the program because they had not originated it; still others actually opposed it either because of reasons mentioned above or because they decided, somehow, that it was a political program.

There are still a few obstructionists, and I suppose we must be reconciled to them in soil conservation as in every other field of endeavor, but with each passing year the Soil Conservation Service program has won more and more active supporters. Today the program is one of the most popular and most widely praised of governmental activities. The program has not been a source of trouble and its backers can be found in both major political parties and among conservatives and liberals alike.

This did not just happen. We sacrificed, and I believe wisely, a more imposing record of accomplishment on the land, to bring about a widespread understanding of the need for conservation and its values. In recent years this early educational work has been paying off in physical accomplishments. In the fiscal year 1942, comprehensive conservation treatment, on the basis of scientific farm conservation plans, was completed on some 5 million acres. In the fiscal year 1949, our accomplishment had increased to 22 million acres.

The charge is being made nowadays that although we are doing a very good job, we are going too slow and do not reach enough farmers each year. This, of course, raises a question about the meaning of "slow." If we were willing to reduce the quality of our work, we could undoubtedly build more terraces, farm ponds, drainage ditches, and diversions every year. We could, by abandoning the fundamental principle of treating each acre according to its needs and using each acre according to its capabilities, vastly increase the total acreage of contouring, stubble mulching, strip cropping, and dozens of other conservation measures. But what value would this work have? How long would it last?

Speed in soil conservation work can only be measured in relation to quality. At the present time, for example, it is taking 24 working hours, or 3 days, for one of our technicians to prepare a farm conservation plan, as a Nation-wide average.

I have serious doubts whether a sound plan can be developed in less time.

I will agree—and as a matter of fact I have been saying for years—that we are not going fast enough. We most certainly need to move ahead faster; the rate of land damage still exceeds, in the aggregate, the rate of land protection. But it would be folly and waste to increase speed at the expense of quality. It would be something like trying to build good automobiles with inferior parts, or with some of the essential parts missing. You could build more automobiles that way, and build them cheaper, but the flaws would show up quickly and then few people would want to buy.

As a matter of fact, the present program of the Soil Conservation Service is moving ahead faster than most people recognize. We are now treating in the neighborhood of 25 million acres a year and simultaneously we are proceeding with farm conservation planning on a somewhat comparable acreage. Work continues on the National Land Capability Inventory and each year, as a result, we know the land facts about an additional 30 million acres. At the same time there is continued progress in education and research.

By any objective appraisal, the Service and the national soil conservation program have come a long way within the 15-year life of this magazine. We have made a most substantial beginning, not only in terms of actual accomplishments on the land but, equally important, in winning the confidence of farmers in our ability to help them with a constructive and necessary job. The biggest part of the job still lies ahead. More than three-fourths of the area in need of conservation treatment is still untreated. But our principles are sound, our quality of work has been maintained at high levels, and our support continues to grow.

If the Service is allowed to proceed with the present program, maintaining the same high standards, basing the work on the needs and capabilities of the land itself, and utilizing the strength of democracy and organization inherent in soil conservation districts, the United States in due course will become the first large nation in the history of the world to succeed, by its own efforts, in achieving a permanently productive agriculture.

It took 45 years from the discovery of the significance of sheet erosion to get where we are now

(Continued on page 15)



My sincere congratulations to Wellington Brink and all other members of the staff of SOIL CONSERVATION Magazine on the fifteenth anniversary of the founding of the publication. Over the years, SOIL CONSERVATION Magazine has served effectively both as a disseminator of popular information on soil and water conservation, and as a semitechnical journal in which rapidly developing research results have been spread among professional workers. SOIL CONSERVATION Magazine is, I think, the best of all Government periodicals.

MILTON S. EISENHOWER
President, Pennsylvania State College

Your SOIL CONSERVATION Magazine was already a year old, or a little older, when Glenn Rule, Elmer Rowalt, and I were recruited into the Service to assemble, as writers and editors, its first popular bulletins, such as *Crops Against the Wind*, *Soil Defense in the Piedmont*, and *To Hold This Soil*.

We relied greatly in those formative years on the truly pioneer work in assembling and presenting information that Wellington Brink was doing, under the guidance of Chief Bennett. And now, 9 years along on another job of editing, *The Land*, I find SOIL CONSERVATION Magazine an even more spirited and reliable trail blazer than I did then. It is the best Government periodical I know.

So I think that all of us who have grown—or are growing—gray in the SCS and related services, governmental and private, should hail your fifteenth birthday with gratitude and affection.

RUSSELL LORD
Editor, *The Land*

Foreign Agriculture magazine takes pleasure in adding its congratulations to SOIL CONSERVATION Magazine upon its fifteenth anniversary. It has helped SCS to perform outstandingly in bringing new consciousness of proper soil use to the United States and in making its leadership felt throughout the world. SOIL CONSERVATION Magazine can justifiably be proud that in every country today there is arising a new feeling of responsibility toward the life-giving resources of the soil.

ALICE FRAY
Editor, *Foreign Agriculture*

Greetings to teen-age SOIL CONSERVATION Magazine on its fifteenth birthday and to the durable Wellington Brink who has guided its destinies from birth to date, from the editor of a thin fortnightly that bore February 6, 1942, as its natal date.

T. SWANN HARDING
Editor, USDA

The fifteenth birthday of SOIL CONSERVATION Magazine is a good time to give well-earned recognition to the role it has played in conservation accomplishment.

For its forthright delivery of the soil conservation message, for the stimulation it has given to soil conservation thinking, for the service it has rendered as a reference source for soil conservation speakers, writers, and teachers, my congratulations—and for the future, my best wishes.

KEITH HIMEBAUGH
Director of Information, U. S. Department of Agriculture

Congratulations to SOIL CONSERVATION Magazine, 15 years old today.

Congratulations, too, to the Soil Conservation Service, the junior partner of each soil conservation district.

In 15 years the district movement has grown from scratch to where now it covers 80 percent of the farms of America. This voluntary growth is phenomenal.

It came about because American farmers appreciated the opportunity of running their own agricultural program. They are enthusiasts for the Soil Conservation Service for two reasons: (1) The high quality of the technicians of the SCS and (2) the extreme care the Service has exercised in *assisting*, but not *running* these 2,200 soil conservation districts.

Happy birthday from the grass-roots democracies—soil conservation districts!

WATERS S. DAVIS, Jr.
President, National Association of
Soil Conservation Districts

I was surprised to learn that the August issue of SOIL CONSERVATION marks the fifteenth anniversary of this very fine magazine. It has, during those years, done much to create a realistic understanding among its readers of the problems and needs of our land and water resources. The results are in evidence on millions of acres of land throughout the Nation.

SOIL CONSERVATION Magazine and the Soil Conservation Service which it represents have, among many other things, helped to bring about the development of a great conservation movement. It is equal in character and force to other great movements including religion and education. This in itself is highly significant because it is world-wide in scope. It is so because of the crusading spirit and technical skills preeminent in the hearts of the men in the organization which SOIL CONSERVATION Magazine represents.

Your magazine has also helped to champion another great cause—soil conservation districts. These districts are as fundamental to conservation as democracy is to



our concept of government. Every effort must be made by governmental workers and others to work with these districts in order that conservation in all its aspects will have permanent leadership and value. The articles and brief items in SOIL CONSERVATION Magazine are materially contributing to this very important phase of the conservation movement.

The task ahead, however, is still big and challenging. We will all continue to look to you for wisdom and guidance because of the skills and research so necessary to build our land resources that are at your command.

Congratulations too—from the Editorial Board of the Soil Conservation Society of America.

WALTER C. GUMBEL

Editor, Journal of Soil and Water Conservation

One of the greatest tasks ever undertaken by Government has been that of reshaping land use in order to conserve soil and moisture. This has involved changing the viewpoints and daily work habits of countless individual farm families and landowners, on a *voluntary* basis.

To accomplish this end, the soil conservation district laws have furnished a mechanism thoroughly in keeping with American tradition. But any mechanism requires motive power to make it effective. In this instance the motive power must come from enlightened public opinion. By presenting, in attractive and intelligent form, reliable information as to what is being done, SOIL CONSERVATION Magazine has helped to mobilize power for an amazing social and economic change. Sincere congratulations on 15 years of solid accomplishment!

PAUL B. SEARS

Chairman, Department of Botany, Oberlin College
Author, *Deserts on the March*

Hugh Bennett is in charge of the most important work in the United States. The United States is a piece of land. On this land we live and when it is gone, we, too, are gone. We have no recourse but to live on land. For some strange reason, a large proportion of our citizens have the short viewpoint of the cow, and think not of the future. Therefore, they waste our *one really vital resource*—LAND!

It has been a heartening experience to a born conservationist like myself to see the Soil Conservation Service rise and grow in its work and the idea of conservation grow in the American mind and spread to the American farm! And your journal carry the light into dark places!

I cannot think of any other person who has done so much to save our land as the tireless and indefatigable Hugh Bennett. May he live long and prosper! To him prosperity would be a chance to serve. He had the luck

to start with almost nothing and could build up a service. Then he had the further luck (skill or wisdom) to get more than his share of enthusiastic helpers.

J. RUSSELL SMITH

Professor, Economic Geography, Columbia University

Congratulations to a magazine that represents so ably the best of all the services. To my mind, the Soil Conservation Service is rendering to the people of the United States a performance so competent and so dignified that it stands as a shining light in the field of government.

Because it subordinates itself so well to the primary conservation task being performed through the locally organized and controlled soil conservation districts, its service is unusual.

Although it asks for little credit, it deserves much. And although I hold the chief, Dr. H. H. Bennett, in highest esteem, I think that the strength of the Service now is in the unusually high quality of the individual men in the field. It is a remarkable force of men, basically unselfish and deeply devoted to the greatest crusade now challenging the hearts and minds of man.

WALTER R. HUMPHREY

Editor, The Fort Worth Press

You are about to close volume XV of the fine magazine SOIL CONSERVATION, which from its birth has consistently recorded the spectacular advance in wise land use spearheaded by the Soil Conservation Service. We still see widespread violation of the principles SCS has promulgated and your journal has effectively presented, but now the general public recognizes them, which wasn't the case 15 years ago. One of the big gains, it seems to me, is the general realization that work and money spent on sound conservation plans are not just added costs in farming; they are the soundest, most profitable investment a farmer can make.

Congratulations on SOIL CONSERVATION's birthday, and continued success to your crusade!

CHESTER C. DAVIS

President, Federal Reserve Bank of St. Louis

The staff of *Rural Electrification News* extends hearty felicitations to its sister publication, SOIL CONSERVATION Magazine, on the fifteenth anniversary of its establishment as official news organ of the Soil Conservation Service. During this time, SOIL CONSERVATION Magazine has rendered yeoman service to the cause of American agriculture and has contributed greatly to the journalistic standards of agricultural publications.

We wish for Wellington Brink, editor, and his staff continued success in their undertaking.

W. HAROLD HAYES

Editor, Rural Electrification News

Fifteen years old, eh? Why, you're just a boy, a sophomore. It takes 15 years just to make grass feel at home in a new environment. A 15-year-old tree is only a sapling. It takes 15 years to get the friendly earthworm back in the soil even with good treatment.

Sure, you've made an enviable start, gotten some of the obstacles out of the way, cleared up the outlines, made friends. But wait till you've got some age on you, another 15 years. We'll see something then, some water tables raised, watersheds nailed down, whole areas farmed the conservation way, continents of land revitalized and put to work for man.

Yes, we're proud of you for what you've done and are, but more proud over what you're going to be and do. "The best is yet to be."

CHANNING COPE
Author, Front Porch Farmer

There could be no greater public purpose in the United States than to promote the conservation of the soil. As you know, the Forest Service has wholeheartedly cooperated with your bureau, since its inception, in that high enterprise. The fifteenth anniversary of SOIL CONSERVATION Magazine is a fitting occasion for congratulations. You should feel gratified on looking back over 15 years of publishing one of the most solidly valuable Government periodicals.

ROBERT T. HALL
Editor, Forest Service

Congratulations to SOIL CONSERVATION Magazine on its fifteenth birthday. Twice your age, we have followed the progress of your publication and feel proud of the attractive and readable standard it has always maintained. Developing in an important and significant field, it has made a real contribution to national welfare. May the magazine and its able editor have many more years of service.

CLARA BAILEY ACKERMAN
Editor, Extension Service Review

The Future of Our American Land

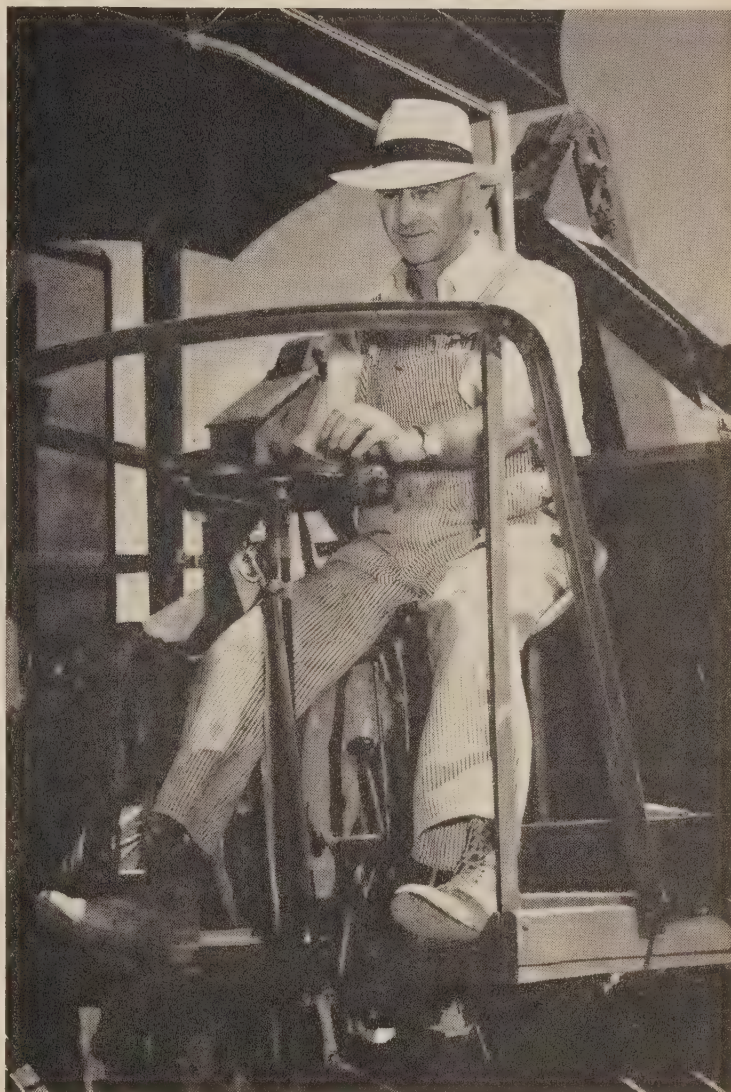
(Continued from page 12)

with our national program of soil and water conservation. There is no other way to provide adequate safeguards for the land. There are various ways of helping along with the job, but for lasting conservation the land must be treated according to kind and need.

Therefore, I hope for the everlasting good of the Nation nothing will be permitted to interrupt or delay this conservation program of the people of the United States.

DISTRICT PROFILE

CLAUDE MEYERS
of
OREGON



Claude Meyers.

Outstanding in a country where everything happens on a grand scale—including soil erosion—Claude Meyers has earned the reputation of being "one of the fight'n'est soil-savers in Oregon."

This "native" Oregonian was born in Pottawattamie County, Iowa, but headed West with his parents at such an early age he doesn't remember much about it.

Claude Meyers is a genial, soft-spoken man who likes to go around in bib overalls and elbow-length shirt sleeves. He dresses this way in all kinds of weather, leading one to believe that he carries some internal and secret fire to keep him warm. Certainly he has fire, energy, and boundless enthusiasm.

Meyers spends most of his time at his 2,300-acre wheat ranch near Echo, Oreg., where he keeps fifty-odd pieces of machinery in top shape and supervises the field work of his two oldest boys, Marshall and Peter, and the hired help.

But he finds time for other things, too.

He is treasurer of the West Umatilla Soil Conservation District and secretary of the Oregon Association of Soil Conservation District Supervisors. He was active in the formation of the association in 1948. Meyers is a director, past director, or member of more than 10 farm organizations, including the Oregon Wheat League and the Umatilla County Land Use Planning Committee. Many of his wide and varied interests are shared by his wife, Frances.

The Meyers family includes two daughters and three sons. The elder daughter, Helen, is a nurse in the Multnomah County Hospital in Portland. Little "Pat"—short for Patricia—attends grade school at Pendleton. Marshall and Peter help their father fulltime at home, while Wayne, the youngest son, is a senior at Pendleton High School.

Claude Meyers' sense of what is right often takes him into controversy. For example, a year or so ago he became convinced that Oregon farmers would benefit from a change in the State soil conservation district law. Not without opposition, he pressed the issue at the biennial session of the State legislature, thus helping to bring the enactment of an improved law which may make it easier for Oregon farmers and ranchers to organize for soil conservation work.

Claude is proud of the fact that his father began to experiment with stubble-mulch farming as early as 1917. Back in those days when the moldboard plow was king, the idea of handling wheat straw on top of the soil to control erosion seemed revolutionary. Nevertheless, thanks in part to Meyers' trail blazing, the practice is widely accepted today.

Many wheat-growing sections of eastern Oregon, including the Meyers ranch, are in the path of winds which often blow with incredible violence. Annual rainfall averages about 10 inches.

Claude tailors his farming operations to suit these conditions. Besides following a grass-wheat-fallow crop rotation—the fallow being required every second year to conserve soil moisture—he adheres strictly to the kind of cultivation that leaves the stubble on top. As an added precaution he farms 673 acres in a system of cross-

wind strip cropping. These 2-mile-long strips give his fields the appearance of a huge American flag.

Claude runs his life by the simple rule that you can get anything done if you try hard enough. Right now he wants the people of Oregon to know more about their soil conservation problems. "Many of our troubles in the past," he says, "were due to the fact that our people simply were uninformed." He wants to change all that.

And knowing Claude Meyers, we think he will help do it.

—ROBERT E. SWANSON

VENEER LOGS

(Continued from page 2)

"At present we are storing logs in only one pond. We have about 150,000 board feet stored, which will operate the plant for 8 to 10 days. We are considering building a big pond to store 1,000,000 board feet, which will be enough to operate the plant for 3 or 4 months. During hot weather we were afraid the logs would dry out and crack or otherwise spoil, so we decided to try storing them in a farm pond on an experimental basis to see how they would keep. We know that they will keep in good condition for at least a year."

—Cal Roark.



BANK OWNS TREE PLANTER.—The City Savings Bank & Trust Co., DeRidder, La., purchased a \$1,000 tree-planting machine for the free use of farmers in its parish.

The machine plants 10,000 seedlings a day.

Out of 2,000 farms in the area, about 500 had tree-planting programs last year, Herbert H. Pye, the bank's executive vice president said in an article in *Burroughs Clearing House*. Demand for seedlings exceeded supply with 331,000 being set out by the planter.

Pye points out that the immediate rise in the value of the farm more than offsets the cost of planting. He estimates that \$15-an-acre land, on which trees are planted, will sell for \$30 to \$35 an acre in 5 years. And when the farmer's capital increases, so do deposits in the bank.

James B. Adkins, Soil Conservation Service technician, and County Agent Ralph R. Brown supervise use of the machine.

SCHOOLS AND FARMS ARE PARTNERS IN JACKSON COUNTY



All branches are represented in classes. This group at Ravenswood includes Jack Tate, Navy, instructor; R. H. Stallings, Seabees; R. L. Sharp, Marines; R. D. Kester, Coast Guard; J. C. Skeen, Army; George Hendershot, Air Force; and Warren Nesselrod, Navy.

By **HUGH F. EAMES**

THE conservation work of veterans in GI classes at Ripley and Ravenswood, in Jackson County, W. Va., has led to a remarkable county-wide educational innovation. Thirty-eight hundred boys and girls, from first graders to high-school seniors, are now studying soil conservation. The new pattern is spreading to other county school systems.

Set up in 1947 to help World War II veterans get a better start in agriculture, the new training course has been developed into a program designed to lift the living standard of 16,000 people in a 461-square-mile area. The accomplishments of 254 veterans and more than 200 vocational agriculture students in two high schools have brought

conservation farming practices to 458 farms containing 71,541 acres—28.3 percent of the land in farms in Jackson County. Indirectly, the program has influenced other farmers to request technical help in applying similar practices. One result is that the number of Jackson County co-operators in the Western Soil Conservation District who have complete conservation farm plans had increased to 376 by the end of 1949.

This success stems from close cooperation of the Jackson County school system, the Veterans Administration GI training coordinator, the Western Soil Conservation District, and the Agricultural Council of Jackson County—a group representing all the National, State, and local agricultural agencies operating in the county. Working effectively with these groups have been Walter Gumbel, conservation specialist for the West Penn Power Co.; representatives of the State Depart-

NOTE.—The author is in current information, Soil Conservation Service, Upper Darby, Pa.

ment of Education and West Virginia universities and colleges; and farmers already operating the conservation way.

The establishment of the conservation course for Jackson County veterans had been under development for several months when the Jackson County Agricultural Council was organized with the agreement that "all agencies and workers in agriculture will talk the same practices when dealing with farmers in the county, and will work up a program and recommend practices that every worker will follow and use in contacts with farmers and others."

Most agencies in the council already were at work for conservation. The county agent was handling education; the Production and Marketing Administration was supplying lime and fertilizer and making benefit payments for specific practices; Soil Conservation Service technicians were, of course, deep in the district program; veterans and other farmers affiliated with Farm Bureau and other agricultural organizations had land that urgently needed conservation treatment; and the GI coordinator and the schools had instructors and teaching facilities. The opportunity to work with groups rather than individuals was unusually attractive.

There were 160 veterans in classes at the 2 high schools. Their average age was 26. Nearly all were married, most wives, like their husbands, being farm-reared. Some had children. One hundred thirty-four already owned or were buying farms. Twenty-six others lived with parents or relatives or worked for farmers who had complete conservation farm plans.

The veterans were organized in classes averaging 25 members. Their instructors were veterans with agricultural and teaching backgrounds. There were 4 hours of classroom work per week—two evenings and Saturday afternoon—and a 2-hour visit to each farm by the instructor. The school district and the GI training coordinator employed the teachers.

In early 1947, when the project got under way, the instructors had the cooperation of council members and guest speakers. Late in the year each veteran received a land-capability map and an assignment to make a revised land-use map and a complete conservation plan for his farm. Instructors and SCS technicians worked with them individually on this.

During this period a 2-day school for instructors was conducted by SCS technicians, district supervisors, and others. It included field demonstrations of planning farms and installing practices, particularly those that the farmer could establish with his labor and equipment. There were visits to farms where conservation practices had been in effect a long time.

It was not until April 1948 that the Western Soil Conservation District and SCS technicians began a check on progress. By August, through visits to farms of 134 GI's for which plans had been developed in classroom work, Ben Speicher, SCS farm planner, had found every veteran waiting to become a district cooperator. Each knew something about the needs of his farm, what he wanted to do, and what he had to work with. Some, not waiting for official approval of plans and agreements by the district, had already installed practices on their land.

All this was a big timesaver. Through use of the information already compiled by each veteran it was possible to check his planning quickly and make necessary changes, and to obtain cooperative agreements on as many as three farms a day instead of the usual one. Here was the first "complete conservation sign-up" by any GI agricultural training group in the State.

The program was a big stride ahead in West Virginia. In Jackson County the previous average had been less than 50 new district cooperators a year. The system brought 140 new complete conservation farm plans to the county in 1948 and was the big impetus in pushing the total to 376 conservation farmers in 1949.

Veterans did more than accept plans and sign district agreements. They quickly started to put these plans to work on their lands, installing most practices with their own labor and what equipment they had or could borrow from other farmers. Some of them rented district equipment and a few employed contractors who work with the district to do the jobs that most farmers cannot efficiently handle, such as building farm ponds and diversions. Progress in 1947, 1948, and 1949 indicates that these young farmers will have their complete plans on the land in 2 to 3 years. As a result of all this activity, school authorities report, veterans had installed on their farms as of December 31, 1949:



When planning of parents' farms is completed, vo-ag boys are required to obtain parents' acceptance. Here W. N. Rhodes (right), father of Charles (left), proudly waits to sign cooperative agreement with district, after they and Ben I. Speicher of SCS have checked the final points in the plan the lad has made.

18,170 linear feet diversion ditches.
 2,163 acres pasture improvement.
 6,466 acres pasture mowing.
 1,000 acres cover cropping.
 12 acres pasture rotation.
 442 acres clearing and obstruction removal.
 1,416 acres alfalfa seeding.
 50 acres mulching.
 1,125 linear feet sod waterways.
 2½ acres tile drains.
 52 gullies controlled.
 41 springs improved.
 19 farm ponds.
 14,263 linear feet stream channel improvement.
 7,000 linear feet stream banks protected.
 61 acres wildlife food and cover.
 638 acres woodland protected.
 20,000 linear feet multiflora rose hedge planted.
 32½ acres new woods.

In ringing up this record, veterans received assistance from GI instructors and Paige Corbin and Jarrett Newlon, SCS technicians.

Progress through veterans classes has opened areas containing many farms where the district had never before been able to get a foothold. It has attracted the interest of nonveteran farmers and paved the way for their becoming district co-operators. It has enabled veterans to make better use of their land, put their work on an organized basis, increase their per-acre production, reduce operating costs, and earn more money to speed payment for their farms.

In the opinion of Wayne Hughes, a district supervisor, farmer, and former teacher, "the conservation program with the GI's has given Jackson County agriculture the best boost it ever had." He says most veterans who are buying farms have a reasonable chance to be successful, because only a few have made bad buys. Some are carrying stiff loads but can handle them, he comments. A



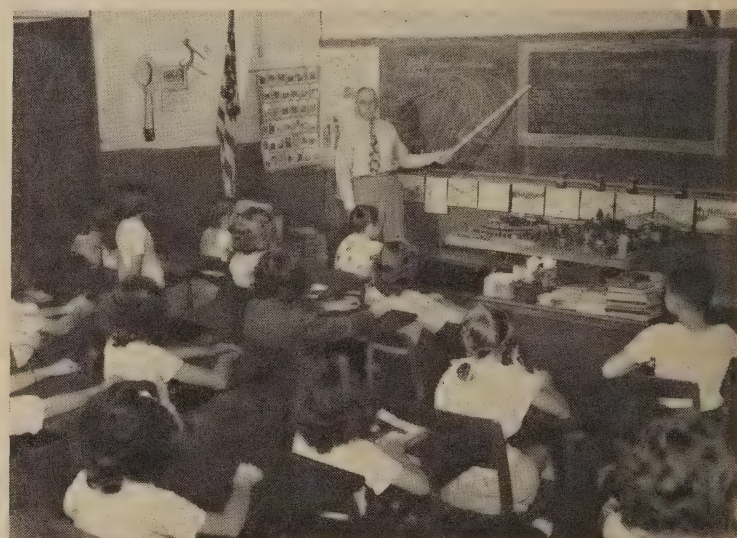
In first grade at Ravenswood, milk is one of the mediums through which the soil conservation course is introduced.



Mrs. Gertha Castro encourages her fifth-grade youngsters to collect Nature's specimens, study them, and write compositions about them. This is a class in Ripley.



A tomato party is a good conservation vehicle for second graders taught by Miss Lourie Smith. Tomato seeds are planted and developed in classroom, then transplanted to paper cups and taken home for replanting in family garden.



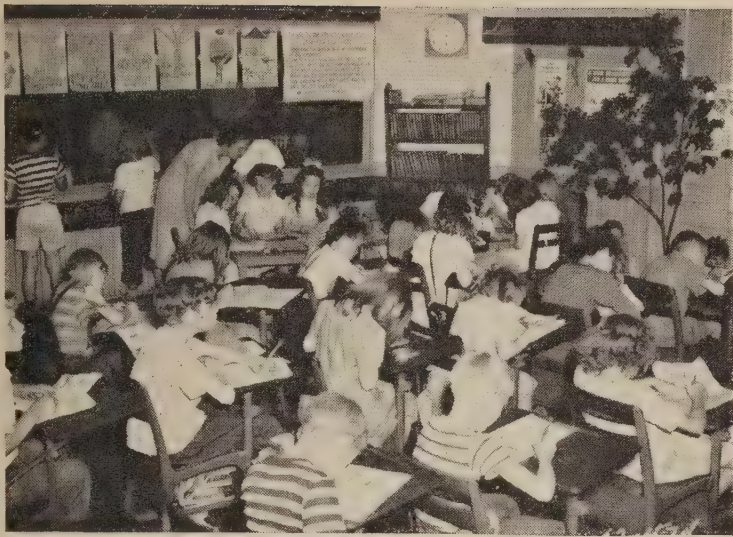
When they enter sixth grade, boys and girls start to learn about farmers and their operations—what a good farmer does. Lloyd Stone here explains four of the most important things in efficient farming.

powerful factor in their success, he says, is their background and their wives' background in agriculture. Of the 160 veterans who started in the classes, only 5 have withdrawn, and some of them—those who left because they lacked funds—will be back when they have laid a bit aside from other employment. According to Hughes and others, the program will reach its maximum results in perhaps 20 years, but the over-all benefits will begin to be apparent within 10 years.

Effective in spurring veterans to top accomplishments have been such experienced farmers as E. G. Wolfe and professional people like Dr. Gay H. Duke, county veterinarian. Wolfe has seen conservation farming pay solid dividends at his 132-acre farm. "Don't wait until you earn the money you need to establish complete conservation farming. Go out and borrow it, and don't worry about the loan. Conservation farming will pay off the

debt and yield you good dividends at the same time," he has told the veterans, who include his own son. Dr. Duke has helped by emphasizing that two-thirds of livestock ills in Jackson County are due to malnutrition resulting from lack of essential elements in feed produced on the farms.

Through 1949 the vets' program continued under full steam. Eighty-five more veterans joined classes, made farm plans, and became district co-operators. There has been no lessening in their interest because the longer they continue, the more they feel benefits from conservation farming. Some are putting extra earnings into herds and switching from livestock farming and cropping to dairy operations, a movement that is steadily mounting in West Virginia. Indications point to continued growth in classes, but at slower rate.



In third grade of Mrs. Nellie Hughes the study spreads to trees. A live one is used, and others show up in art work.



Seventh-grade pupils under Melvin Horn at work building farm models which incorporate some of the things they have learned about conservation farming.

The program has produced a variety of results. All veterans whose soil shows deficiencies are enrolled in PMA's lime and fertilizer program and are receiving benefit payments for installing specific conservation practices. Those interested in grassland farming receive the assistance of the county agent and other Extension workers. They also have help from a State Conservation Committee forester and game technician.

With the attack well launched among the veterans, organization of a like course for vocational agricultural classes was started in two high schools. By February 1948 a well-organized course was ready for 126 boys—86 at Ripley and 40 at Ravenswood. It was built around the requirement that each vo-ag freshman, as his initial assignment, must make a complete conservation farm plan for the home farm and get it accepted by his parents, if a plan was not already in opera-



In the fourth grade, pupils study construction of plants, grass, and trees in drawing and painting, with Mrs. Dorothy Gillett teaching.



Eighth graders in the Sandyville school here are shown sloping, liming, fertilizing, seeding, and mulching eroded bank next to school athletic field. Ground work is done by boys, planting by girls, under direction of SCS technicians.

tion. Where there was a plan, a revision to meet current situations was required.

This course produced 54 new farm plans the first year and is expected soon to yield 100 annually. The boys' acceptance of the course is seen in increased enrollment that already has required an additional teacher at Ripley. At the start, 126 boys in conservation classes represented 17,320 acres. By November 1, 1949, the number had increased to 204 representing 27,560 acres.

In addition to classroom instruction, students have considerable field activity in which they help plan, lay out, and install practices under guidance of teachers and SCS technicians. They go on tours, sometimes to other counties, to see conservation practices at work under varying conditions and to talk with farmers about their experiences and benefits.

Ravenswood and Ripley classes have small nurseries where vo-ag boys raise tree and shrub planting stock, including multiflora rose, for use of district cooperators. Also they build knock-down forms that conservation farmers and SCS technicians use in building farm livestock watering troughs near ponds and springs. Their interest in all phases of agriculture is expanding. More trees and shrubs were planted on Jackson County farms in 1949 than in six previous years.

With GI and vo-ag conservation courses moving ahead, school administrators, soil conservation district supervisors, and the agricultural council, under the general leadership of Delmer K. Somerville, assistant county superintendent of schools, began to build a conservation course that would do a heretofore unheard-of educational job; it would begin with first graders and carry them into junior- and senior-high vo-ag work.

State educators, college and university heads, conservation experts from Government and private enterprise, district supervisors, council members, school administrators, teachers, joined in planning. They finally whipped together a course that won unanimous approval. It was given a test run in the spring term a year ago.

Inasmuch as 80 percent of the school population comes from Jackson County farms, the course is designed as an indirect, long-term program to develop aptitudes, knowledge, and skills that will be effective in expanding conservation farming in coming generations. Nearly 3,000 boys and girls in the grades have been brought into the program during its first full year. The school rooms and grounds are their laboratories. In the higher grades they have opportunities for field observation. Soon perhaps—and this is no idle dream—there will be a school-district conservation farm at which they can study during earlier years and operate in high-school years. With the start of the new school year last fall the course was being taught to 2,993 boys and girls in the 70 elementary schools, and 891 pupils in 1 junior high school and 2 senior high schools.

"In elementary grades," Assistant Superintendent Somerville says, "much of the course is integrated with such regular subjects as spelling, arithmetic, art, writing, geography, science, and history. It differs from the secondary school program in that no effort is made to lay out soil-saving practices and put them on the land.

"We expect to have a fuller development next year, after we have had a year of teaching experience in all grades. More and more teachers are taking hold of this course, and other schools—sometimes as many as four or five counties in joint meeting—are asking for our help in getting started on a like program. We are highly pleased with the activity as it grows and spreads."

The vets are pleased because they have developed peace-time leadership, set a pace for others, and at the same time they are managing to do a better farming job.

NOTES FROM THE DISTRICTS

DISTRICT TEACHES TOWN.—The Orleans County (Vt.) Soil Conservation District has purchased a tract in the town of Westfield for use as a demonstration forest area. North Troy vo-ag boys have set out approximately 1,400 white pines in the 2-acre tract.

UNIQUE AGREEMENT.—Allegany County (N. Y.) Soil Conservation District has just uncorked something new by making a working agreement with itself. This agreement covers conservation work—particularly stream-bank maintenance on the bordering river—on property leased for the district shop. Under the district's agreement with itself, SCS technicians have prepared plans which include a revetment of willow trees.

SMART PROMOTION.—Door prizes at the annual meeting this year of the Clinton (Ill.) Soil Conservation District were two 2-acre pasture-improvement plots. The winners were T. C. Gamble and Wayne Maschoff. Money for seed and fertilizer was donated by banks in the district. The winners select the plot to be treated and do the work. The plots make good demonstrations for the neighborhood and will be visited by groups on tours.

Banks in the district also paid for pencils which were given to all who attended the annual meeting. The pencils were printed "Soil Conservation Pays—Compliments of Clinton County Banks."

THEY'LL SEE US EACH MONTH.—In cooperation with local bankers, the supervisors of the South Jersey Soil Conservation District have obtained funds for a year's subscription to SOIL CONSERVATION Magazine for each cooperator in the district.

NATION-WIDE CONSERVATION TOUR.—Connecticut has just come up with it—the first Nation-wide conservation tour. It will be held in the summer of 1951 as part of the summer session at the University of Connecticut. Dr. Raymond Kienholz, forestry professor, will be in charge. It will take 25 men and women on a 12,000-mile swing—to California by the southern route, up the Pacific coast to Washington and back by a northern route—in

8 weeks. The group will travel by bus, with each member having a sleeping bag and waterproof shelter, which means that nights will be spent in State and National parks and forest camps. Through cooperation of Government and private agencies, travel will include areas not open to the general public. A traveling kitchen, accompanying the bus, with an experienced cook and trained dietitian in charge, will supply hot food. Students and teachers will make up most of the party. Students who fulfill requirements will receive six credits. Estimated cost, including food, lodging, transportation, tuition, and incidentals will be \$400. Dr. Kienholz taught in Illinois and the Philippines, held a Sterling fellowship in forestry at Yale and was State forester in Connecticut for 4 years. He has traveled widely, done research in forestry and botany in six States, and in 1947 drove his son and daughter over much of the route that is to be covered by the tour.

TOP PERFORMANCES RECOGNIZED.—At the Fourth Honor Awards Ceremony of the Department of Agriculture in Washington, D. C., May 25, six members of the Soil Conservation Service received Superior Service Awards:

Fred W. Blaisdell, Minneapolis, Minn., for developing and perfecting the hydraulic design for structures used in soil conservation and water-control programs.

Henry Howard Finnell, Goodwell, Okla., for his contribution to the agriculture of the Southern Great Plains, particularly for development of wind-erosion control methods in semiarid areas.

Duthiel W. Fortenberry, Tylertown, Miss., for helping to develop a permanent-type agriculture based on good land use in the Walthall County Soil Conservation District.

David H. Foster, San Antonio, Tex., for developing new and improved plants for use in soil and moisture con-



Foster . . . Klingebiel . . . Fortenberry . . . Chief Bennett . . . Finnell . . . Blaisdell . . . Saveson

WOODS DATA.—In a study of 115 dairy farms in Vermont, Dr. Robert Carter, University of Vermont, found cordwood being grown about five times as fast as it is being cut, while saw timber is being removed about twice as fast as it grows. Wood lots are seriously understocked, partly due to grazing and inclusion of areas of old pasture being reconverted to woods. Farmers averaged \$1.34 per hour labor return for forestry work over and above taxes, interest, depreciation, and other costs. The return per hour for labor on farms with small wood lots is smaller than the return on farms with larger wood lots. Farmers' valuation of wood lots average \$19 per acre, with \$46 per acre as their valuation on sugar bushes. Country foresters value all wood lots at \$27 per acre. Labor returns per hour for different wood products ranged from \$1.03 for sugar wood, \$1.05 for pulpwood, and \$1.08 for fence posts to \$1.30 for maple sirup, \$1.51 for stovewood and \$1.90 for sawlogs.

servation, and for educational and informational activities creating public interest in grasses.

Albert A. Klingebiel, Champaign, Ill., for leadership in developing techniques and procedures of presenting land-capability information to farmers, coordinating soil conservation survey activities, and training SCS workers.

Irwin L. Saveson, Baton Rouge, La., for designing an improved system of field drainage for sugarcane land and developing efficient methods of constructing drainage works.

For more than 40 years of work, Lewis A. Jones, chief of the water conservation and disposal practices division, received a Length of Service Award.

At a later date, awards will also be made to the Perry, Okla., and the Purcell, Okla., work units for outstanding accomplishments in the Noble County and Canadian-Walnut Soil Conservation Districts.



CHICKENS ON CONTOUR.—On Guy Leader's poultry farm near Shrewsbury, York County, Pa., range shelters are contoured on strips nearly a mile long. Leader, a Pennsylvania State Senator, owns and operates six poultry farms, each under a complete conservation farm plan prepared by SCS technicians. The dark strips are in Ladino clover and timothy. The open strips have been plowed for corn.

York County has more than 1,100 complete conservation farm plans established on the land. The York County Soil Conservation District has been operating for nearly 12 years. At many points, as far as the eye can reach, only conservation farming can be seen.

BANKERS OFFER AWARDS.—Recognition is to be given Monroe County, Wis., farmers who have become co-operators with the Monroe County Soil Conservation District during 1950. The Monroe County Bankers Association will reward each farmer participating with a subscription to SOIL CONSERVATION Magazine.

The bankers association, which includes all of the banks in Monroe County, is using this method to show appreciation of farmers following soil-conserving practices.

SONG OF SOIL.—During his work as a soil conservationist in Oklahoma, Walter A. Groom wrote a poem entitled "At the Foot of a Hill." The poem told the story of conservation so vividly that W. B. Russell, another soil conservationist of Kootenai County, Idaho, made type-written copies and sent it out to his agricultural friends. A copy was also sent to Ernie Jorgenson, farm editor, KXLY, Spokane, Wash., who suggested that Clyde and Pal, hillbilly singers, set the words to music. Composer Del Yandon was called to assist and the song was written and presented for the first time on the air by Clyde and Pal, March 9, 1950.

GOOD IN ANY LANGUAGE.—Bob Anderson, work unit conservationist with the South Goodhue (Minn.) Soil Conservation District, has written what is believed to be the first farm plan for translation into Norwegian.

The plan is for Einar Lomen, who arrived recently from Norway to take over a 168-acre farm which he inherited. The farm was so poor and run-down that Lomen despaired of making a living on it. On looking for assistance he was

directed to the soil conservation district office and Bob Anderson.

The plan Bob worked out was of no use to Lomen; he couldn't read a word of English. So Alf Larson, principal of the Wanamingo schools and a native of Norway, translated the plan into Norwegian. With the plan in hand, Lomen hopes to be a success as a farmer and as an American.



Tom Stolen looking over plan with Bill Clark (left) and Jack Densmore.

WINNING COUPLE.—The 1950 W. G. Skelly award for superior achievement in agriculture went to Tom and Thelma Stolen of Cottage Grove, Wis., in the Dane County Soil Conservation District.

Tom and Thelma were selected by a committee of 10 farm leaders on the basis of successful production on 144 acres. Soil conservation is a "must" with the Stolens because the soil on their farm isn't the world's best. Tom is never too busy to show or tell other farmers about soil conservation. His entire farm has been terraced or strip cropped. All waterways are grassed, 28 acres of pasture have been renovated. Land use on the Stolen farm has been completely changed since he signed an agreement with the district 8 years ago.

The influence of the Stolen family is extensive. Hundreds of touring farmers, as well as numerous writers and photographers, have visited the farm in quest of ideas and encouragement.



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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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SEED ALONE PAYS BILL.—Supervisors of the Northeast Alabama Soil Conservation District report that seed harvested in 1949 from three new "crops brought to the district by the Soil Conservation Service" for observational plantings since 1944 had a value in 1949 alone of \$217,000.

This was more than 2½ times as much as was spent by the Service in 1949 for direct assistance to the district, including salaries of the district and work unit conservationists and all other permanent personnel and aids, office rent, equipment, and other direct assistance.

A good portion of the seed was used by farmers for increasing the acreage of these perennial or reseeding annual crops, which will mean a still larger acreage that can be harvested for seed this year.

Largest value of seed harvested was for Suiter's grass (Kentucky 31 fescue). The 315,000 pounds of seed harvested at current prices are worth \$157,000. Seed for the first planting of this new grass was furnished to the district from SCS regional nurseries as a part of the program to estab-

(Continued on page 41)



FRONT COVER.—This is the fourth round in the construction of a terrace in Illinois. It is a part of the farmer's complete soil and water conservation plan, is designed to check water runoff, save soil, and hold moisture for use when needed.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



The 18-inch grain sorghum stubble left on this field prevented any serious soil blowing last spring even during winds of 65 to 75 miles velocity.

DUST BOWL SITUATION IS REVIEWED

By CYRIL LUKER



Fence-row drifts appear where soil and water conservation practices have not been followed. If moisture had been conserved to give good crop growth, and sufficient crop stubble had been left and protected, drifting like this would have been prevented.

THE use of soil and water conservation practices undoubtedly has prevented the return of full-fledged Dust Bowl conditions to a large portion of the Southern Great Plains this year.

But the situation is critical over the old Dust Bowl area of the "dirty thirties." Drought, which

has prevailed over most of the Plains country since last fall, has caused wheat-crop failure on thousands of acres, and a very short harvest generally. This means that there will be little wheat stubble to protect the soil against blowing next winter and spring. The drought, if it continues, also will lessen the chances of producing good grain sorghum crops that would provide residues for wind-erosion protection during the next blow season.

NOTE.—The author is regional director, Soil Conservation Service, Albuquerque, N. Mex.



This farm has been severely damaged by wind erosion. Soil drifts or hummocks have formed in field and drifts developed at fences. This field was cultivated in straight rows, the crop stubble was cut very short, and even this slight protective cover was grazed heavily. The farmer is a vigorous objector to the use of soil and water conservation practices.

The worst dust storms since the thirties have swept over the Plains country this year. It is estimated that around 2,500,000 acres in the old Dust Bowl area have suffered moderate to severe wind-erosion damage while an even larger acreage was subject to slight soil blowing.

There has been little or no damage to lands where proper soil and water conservation practices have been followed. On grain sorghum fields where stubble 12 to 14 inches high was left at harvest, protected against grazing and not plowed under, there was little soil blowing this year. The same was true where a stubble from last-year's wheat crop was left standing for fallow, and where wheat, even though killed by drought, was not grazed off or plowed under.

The continued breaking out of sod land unsuited for cultivation has greatly increased the wind-erosion hazard. It is estimated that since the start of World War II, approximately 3,000,000 acres of grassland, at least 60 percent of which is not

suited for continued cultivation, have been plowed. Too, a large portion of this area is owned by non-residents who have been willing to gamble against the danger of wind erosion because of the high price of wheat.

Perhaps the most important question now is whether these absentee owners are going to take proper measures to protect their fields against blowing. Some local residents think these so-called "suitcase farmers" will try to halt wind erosion, but others are skeptical. The doubters say that many of the absentee owners have harvested several bountiful crops that have paid them a handsome profit, and may be reluctant to sacrifice these gains if there are successive crop failures. Any abandonment of land can only intensify the soil-blowing-control problem that may be faced by resident farmers.

However, not all of the soil blowing can be attributed to improper land use on the part of absentee owners. A lot of resident farmers also have



The owner of this farm is a conservation leader in his neighborhood. He uses terraces and contour farming for moisture conservation, and high stubble is left on fields at harvest and protected against grazing. The modern farm-house in the background tells his success.



Millions of acres in Southern Great Plains that are unsuited for cultivation should be put back to grass. Many farmers are reluctant, however, to return to grass as long as there is moisture enough to produce wheat. Then, when drought comes, as it now has, the reseeding of grass is difficult. This old cultivated field was drilled to grama in 1941, and now is adequately protected against both wind and water erosion.

been willing to gamble on quick riches from high-priced wheat, and have broken out sod land that is unsuited to permanent crop farming.

Soil and water conservation practices are being applied on more land in the old Dust Bowl area this year and have proved their value as never before.

Unfortunately, there still are some farmers in the area who permit all-important moisture to run off their land, graze their stubble fields, and otherwise misuse their land. These farmers not only are allowing erosion to destroy their land, but also are permitting their blowing soil to damage the fields of neighbors who are following conservation practices.

The most important job now, of course, is to get a protective cover back on lands that have been blowing. Contour farming, with terraces where needed, and other water conservation practices.

should be used to hold all available moisture for crop growth.

Where the wheat crop failed this year, fields should be planted to grain or forage sorghums and a high stubble should be left on the land for protection against soil blowing next winter and spring.

Of course, land unsuited for cultivation should be put back to grass as soon as possible. However, this is extremely difficult during dry periods when soil blowing is serious.

Heavy rain this summer and next fall is the only thing that can prevent a return of Dust Bowl conditions next year. But rain alone will not do the job. All moisture must be conserved for growing crops that will provide stubble and straw, and these residues must be properly managed if wind erosion is to be controlled and return of the Dust Bowl averted.

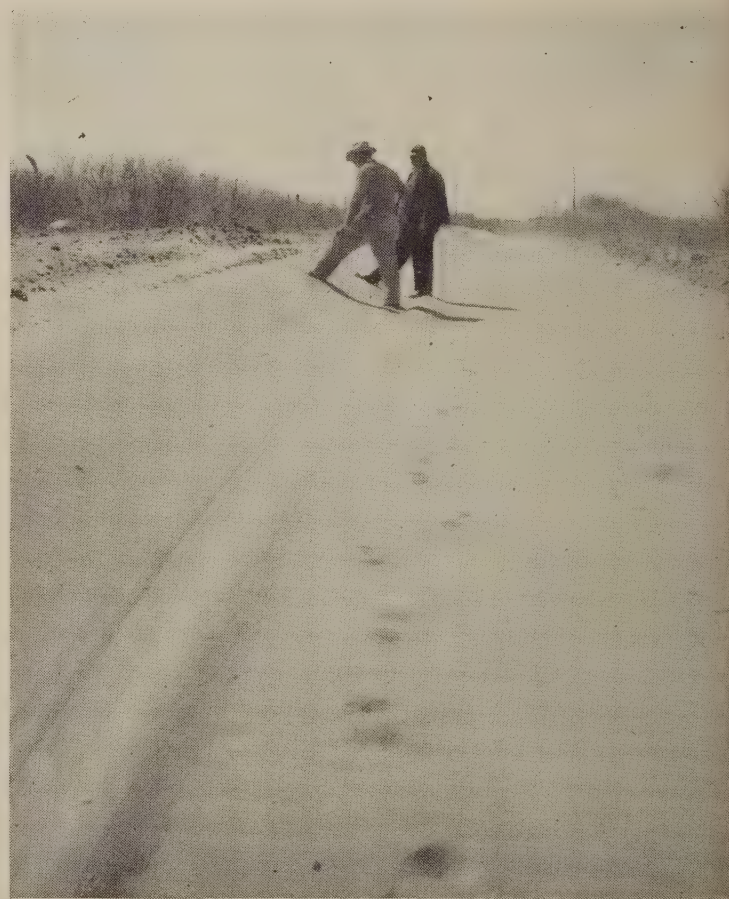
WINDS CAME AND SAND BLEW

By **RAYMOND A. HIGGINBOTHAM**

EMMETT HOBSON had been getting along fairly well with his 160-acre farm near Dickens, Tex. To be sure, the land was badly eroded when he bought it in 1947 but the price was reasonable and he had been able to complete payments by selling his mineral rights. He became a cooperator of the Duck Creek Soil Conservation District. He lost no time planning and starting application of a coordinated soil conservation program to control erosion and build up productivity. He had the help of SCS technicians.

Of course it was going to be a slow, uphill fight to make such abused and badly eroded and depleted land profitable again. But Hobson was young and industrious, and he realized the value of using the land for what it can produce best and most safely and in treating it to keep it permanently productive. Hobson's prospects were good.

NOTE.—The author is with the Soil Conservation Service at Spur, Tex.



Emmett Hobson and SCS man Raymond A. Higginbotham view sand piled on county road bordering Hobson's farm. It blew from a 35-acre field left without protection against wind erosion.

Then he made a mistake, which he freely admits. He ignored the recommendations of his conservation plan. After grazing 35 acres of Sudan

planted in the spring of 1949, he one-wayed the field in September to prepare a seedbed for fall sowing of rye and vetch. He gambled on weather! "I was sure there'd be enough rain to get the vetch and rye up to a good cover before the wind started."

Hobson guessed wrong. There was not enough rain even to plant the rye and vetch. The sandy soil was loose and in perfect condition to blow when the inevitable 1950 winter winds came. Great clouds of what little topsoil was left billowed out across the county road bordering the farm, settled on other farms, or soared high into the air to mix with soil blowing from other areas.

The soil from Hobson's field piled up in big drifts along the fence and in the county road. Three or four times the road had to be cleared of sand so that cars could get through. The large banks of sand along the shoulders of the road also had to be removed.

"I told a county commissioner that I surely would like to have that sand spread back on my field," Hobson commented. "That's good topsoil and I didn't have any too much to start with. I'm going to remove the field fence so that a grader can push the sand back on my land."

Hobson has learned his lesson. He said: "There ought to be a law against selling one-way plows to farmers on sandy-land farms." He was only joking, of course, for he knows that one-way plows have a proper place even on sandy-land farms.

From now on, he is going to stick close to the conservation plan he drew up with the help of the Soil Conservation Service technicians. He said: "I'm going to sow the field to Sudan again this spring. Then I'm going to sow the rye and vetch, using phosphate as fertilizer, in the Sudan stubble next fall. No more one-waying for me. And no more gambling with weather. The rain might not come but sure as shooting the wind will."

Hobson still has good prospects of making a profitable venture out of his farm. But it's going to take a little longer now.

SOIL-CONSCIOUS BANK.—In its annual statement the Farmers State Bank of Manawa, Wis., says: "This bank has set up procedures to enable farmers to secure soil conservation loans. The future of our community depends on the productivity of the land in our area."

The bank held a soil conservation clinic in 1949 in cooperation with the Waupaca Soil Conservation District. Over 400 farmers attended. It's to be an annual event.

DISTRICT PROFILE

BARTE
of
NEW MEXICO

Lee G. Barte is one of the most unusual persons in soil conservation in New Mexico.

Less than 2 years ago, Lee was a civil-engineering student in the University of New Mexico and planning a career in this field. All he knew about soil conservation at that time was what he had picked up from his father, who was secretary-treasurer of the Tijeras Soil Conservation District near Albuquerque.

When the elder Barte died in November 1948, Lee decided to forego his engineering degree, which was less than a year away, and take over the management of the family dairy.

Young Barte was named immediately to succeed his father as secretary-treasurer of the Tijeras district. He rolled up his sleeves and went to work studying the district's problems. In February 1949 he was appointed to the executive committee of the New Mexico Association of Soil Conservation Districts. In September of that year he served as general chairman of one of the largest "Farm-in-a-Day" programs ever undertaken. Next, he was program director for the 1950 New Mexico association meeting. Then, when the past president declined renomination, Lee Barte was selected by acclamation.

Today, at the ripe old age of 25, Barte is the youngest district supervisor in New Mexico, and undoubtedly the youngest State association president in the country.

Lee was but 4 when the elder Barte sold his purebred Holstein dairy and breeding business in Watertown, Wis., and came to Albuquerque to set up a dairy. As a boy, young Barte became thoroughly acquainted with the chores which start on a dairy farm around 4:30 and are not finished until around 7:30 to 8 at night.

He was graduated from the Albuquerque High School in 1941. As a 4-H Club member, Lee was high-point man on the county livestock judging team and won a trip to the Western Livestock Show in Denver. Pearl Harbor came a few months after he enrolled in the University of New Mexico.

On completing his freshman year, Lee entered the Naval Officers Training Corps, was commissioned an ensign in February 1945, and sent to the South Pacific with the amphibious forces. As commanding officer on an LST, Barte was at Okinawa and took part in the closing campaign in the Philippines. He then went to Japan with the initial occupation forces.

Returning home in July 1946, Barte, already with a degree in naval science, decided to study civil engineering. He was married in January 1947, and now has two daughters, ages 2½ years, and 11 months.

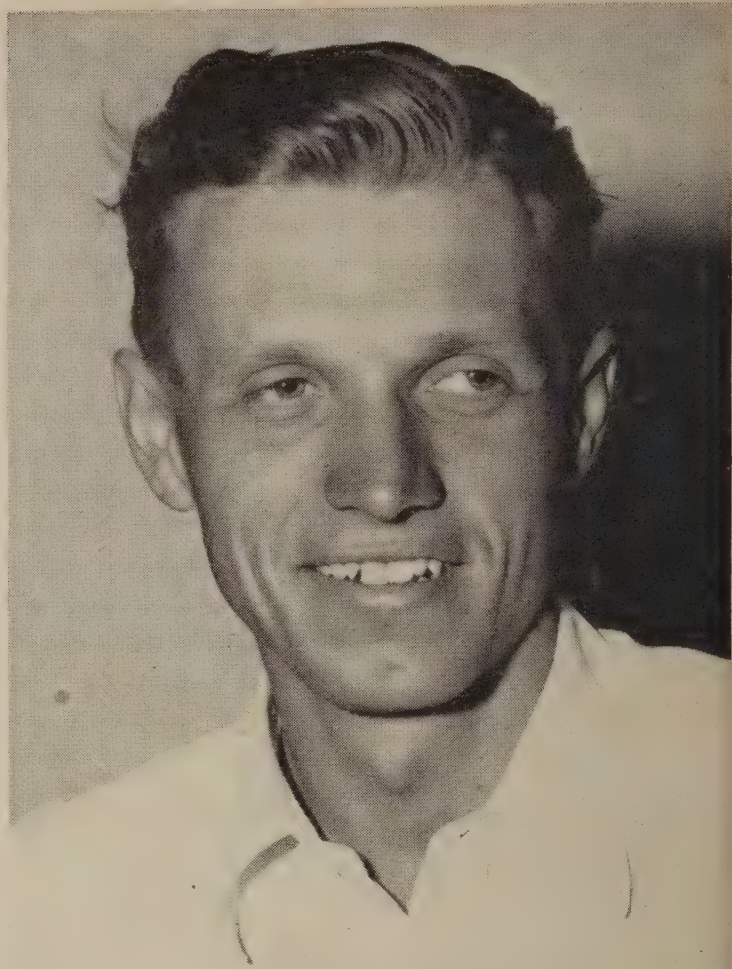
In 1948 he won the NBC-sponsored "RFD America" radio contest in New Mexico and finished second in the national contest in Chicago, taking \$800 in prizes.

When his father died, Lee didn't hesitate to take over the dairy, which is one of the three independents left in the Albuquerque area. The father, who had been a leader in the formation of the Tijeras Soil Conservation District, already had a soil and water conservation program well under way on the 70-acre farm.

Originally, the Barte farm had only 7 acres in cultivation, the rest being swampy and very unlevel. Young Barte picked up the conservation program where his father left off. Today, the entire farm is level and can be irrigated within 24 hours, without watching, because of the improved irrigation system. Alfalfa and corn supply all the roughage needed for the 50 head of Holstein cows that are milked the year round. A program of permanent irrigated pastures of Ladino clover and orchardgrass has been started. Eight acres already are in pasture and another 25 acres will be seeded. The first cutting produced 2½ tons of hay to the acre, and Barte figures that he should get 10 tons annually from land that is little better than average.

A pond, designed for overnight storage of water for irrigation, also provides fish and recreation. It was stocked with fingerlings 2 years ago, and now is yielding 3½-pound bass. A ½-acre wind-break around the farm site provides protection from westerly winds.

But Lee Barte's conservation activities are not confined to his own farm. When the Sisters of St. Anthony Boys' Home, on the outskirts of Albuquerque, asked assistance of the county agent and the SCS district conservationist in the sum-



Lee G. Barte.

mer of 1949, a Farm-in-a-Day demonstration was proposed.

A meeting of representatives of Friends of the Land, the chamber of commerce, civic organizations, the county agent, the Tijeras district, and SCS was called. It was decided that the 80-acre farm would be completely remade in a day; the land was to be leveled, a modern irrigation system installed, and pastures seeded for the dairy herd. All buildings would be repaired and repainted, new barns built, and recreational facilities improved for the 300 orphan boys of the home.

Lee Barte was named general chairman. For 7 weeks he worked practically day and night, actually at the expense of his own farm work.

But the demonstration was a huge success. More than 1,000 skilled craftsmen donated labor, and machinery worth a million and a half dollars was used. Rain caused the affair to be continued into the second day, but between 50,000 and 60,000 persons visited the farm to watch the biggest soil conservation job ever undertaken in New Mexico.

Upon being named president of the New Mexico

(Continued on page 41)

NORWAY HAS PROBLEMS, TOO!

By DR. AASULV LØDDESØL

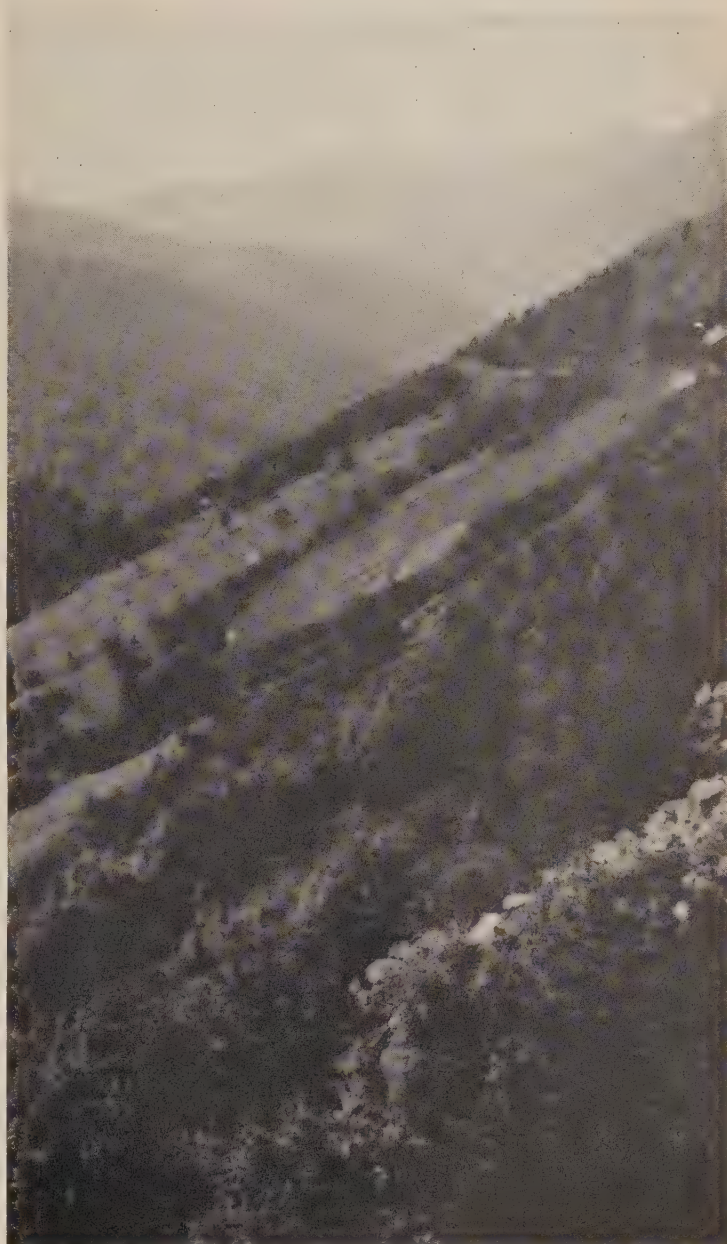
THE total area of Norway is 125,258 square miles. Of this, 5,798 square miles are occupied by lakes, 4,310 square miles are in agricultural land, and 28,951 square miles are in productive forest. About 48 percent of the total lies above the forest limit. These mountain areas consist partly of snow and ice fields, but mainly of rock more or less covered by morainal soil, locally formed mineral soil, or bog formations.

Norway is a very long country. North to south, it reaches from $71^{\circ}11'$ to $57^{\circ}57'$. The straight line from the North Cape to Lindesnes measures 1,091 miles, or about the distance from Lindesnes to Rome.

A rugged country, Norway's surface soil is liable to destruction by landslips, erosion, and similar forces. Rainfall and temperatures have a wide range of variability. We have, for instance, the typical coastal climate of western Norway, where there is little difference in summer and winter temperatures and where precipitation totals up to 10 feet a year. We also know the typical inland climate of our dales and highlands, characterized by little rainfall (about 12 inches), warm summers, and cold winters. Farthest north there is the long, dark winter night, when the sun does not show above the horizon from December till February. To compensate, this region has a short but hectic summer, with midnight sun, and at times, forcing, warm weather for 2 or 3 months in the middle of the summer.

With this short background, we shall take a look at the problems confronting us in Norway with regard to the conservation of the surface soil from destruction.

As we know, soil destruction may arise from *natural* as well as from *social* causes. Natural causes are generally attributable to topography, climate, and the like; while social causes, as a rule, derive from over-population or from the ever-growing pressure of continuously increasing population. In Norway, where the population is ap-



Cultivated plots in a steep valley strongly exposed to erosion. From Sunndal in Møre and Romsdal County. (Photo by Løddesøl.)

proximately 3,000,000, or about 25 per square mile, one might think that population pressure could not exist, but such is not the case. Also, in our country there are densely populated places where the inhabitants have few natural resources, such as soil and forest. This is especially so in the coastal districts of the western country (Vestlandet) and of northern Norway (Nord-Norge), where the lack of forests for fuel supplies is badly felt. Here, peat has throughout the ages been utilized for fuel, and this in the long run has caused considerable

NOTE.—The author is director of the Norwegian Peat Society and chairman of the Soil Conservation Committee of the Norwegian Department of Agriculture. This article is based on a paper which was presented at the United Nations Scientific Conference on the Conservation and Utilization of Resources, held at Lake Success, N. Y., August 17 through September 6, 1949.

destruction of soil. This is both an economic and a social problem. Economic conditions have been, and in some parts are still, so restricted that the people cannot afford to buy fuel elsewhere. Therefore, the sparse surface soil has to suffer by being utilized for fuel.

Among natural causes, landslides or slips first come to mind.

The marine clay deposits in southeastern Norway (Østlandet), in the Trondheim districts, and in some valleys in northern Norway are very subject to slides which cause much destruction. Our largest landslide in historic times was the one in Vaerdalen near Trondheim in May 1893, when about 740 acres of soil subsided, slid, and raced towards the bottom of the valley. About 2,116 acres were flooded and covered with slushy clay. The bulk of the washed-out clay has been computed at 72,000,000 cubic yards. Twenty-six farms were totally destroyed, and 100 farms more or less damaged. Two hundred fifty people lived on the subsided land, and 112 of them were killed.

Such landslides as this are known in Norway as clay slides. The soft clay substratum slides away and, together with the firmer ground on top which

breaks up into floes and patches, is carried at great speed down the sides of the valleys towards rivers, lakes, or fjords. The whole mixture becomes a surging slush that destroys everything in its way.

Destructive clay slides frequently destroy a good deal of productive land and cause other damage. According to Holmsen, the cause of such clay slides must be sought in the variations of the contents of salt and water in the clay. Hydrostatical measurement of underground water in clay deposits shows that the content of water varies with the seasons and the rainfall.

Clay slides are, in other words, the floating away of large masses of clay which contain a high percentage of water. They occur where the substratum of "kvikleire" (quick-clay) finds an outlet. As a result the ground fails to support the overlying masses of soil, which sink down and float away on a stream of slush.

Landslides or slips also occur along rivers and streams, where, because of the swiftness of the current, the water cuts into the banks, causing unsupported portions to subside and slide out.

Landslides also occur around ponds and lakes, especially after measures have been taken to lower



Soil erosion on a bog in Kornstad district, Møre and Romsdal County. (Photo by Holmsen.)

the surface with a view of securing more arable land. When rivers are being regulated or lakes lowered, attempts are made to prevent loss of soil by building embankments on both rivers and canals, where falls or slides of ground are feared. Unfortunately, it is not always possible to predict where such slides will occur and, consequently, year by year some soil is lost in this way.

Avalanches and rock slips and the cracking and collapse of steep mountainsides result not infrequently in loss of soil, forest, or buildings in narrow mountain or fjord valleys, especially in the western part of the country. Such natural catastrophes are hard to prevent in a country like Norway, with its wide variety of landscape formations.

Other types of soil loss occurring in Norway have been classified by Røyset under the following five headings:

1. Natural shrinkage by drainage of swamp land.
2. Natural waste by liming, fertilizing, and tillage.
3. Waste of soil by weeding and by removal with potatoes and root crops.
4. Loss of fine-grained soil by strong wind—so-called dust storms.
5. Loss of soil by erosion.

For the subsidence of cultivated bog soil at Stend Agricultural School in Hordaland County, Byrkjeland has noted quite considerable figures—nearly 5 feet—in the course of about 65 years. He has also collected statements from farmers in 33 parishes in Hordaland, and on the strength of this material he has arrived at an average loss of about 0.8 inches per year by ordinary cultivation, rotating between open crops and meadow. The necessity of digging fresh drains after about 30 years, the cropping up of stumps, stones, and rocks in the humus layer, and the loss of land at the edges of the bogs result in reduction both in amount and quality of arable land. Where the bogs rest directly on top of rock or on gravel with large stones, this form of waste of soil is most damaging.

Where the underlying ground is not cultivable, the depth of the bog soil to be brought under cultivation should be over 3 feet, especially if it is intended for very open-standing crops. For pasture or permanent meadow one may, however, undertake the cultivation of somewhat shallower bogland, even though the lower layer may not be



Reforestation in the coastal districts of western Norway (Hjelma in Hordaland County). A 34-year-old plantation of *Pinus mugo* Turra (*Pinus montana* Mill). (Photo by Løddesøl.)

tillable. The degree of firmness is an important consideration.

It is often difficult to distinguish between the separate forms of loss of soil tabulated by Røyset as 1, 2, and 3. One may say that the notes taken by Byrkjeland comprise in one total all these three forms of soil waste.

The form of soil wastage mentioned under point 4 as dust storms is particularly noticeable under the conditions of our western districts. Soil wasting during dry periods with strong wind occurs both in the spring and during black frosts in winter, but is generally limited to minor areas. On farms in parishes particularly exposed to northerly or southeasterly winds, which are worst in the spring, the dust storms may result in topsoil being blown off the fields. From the district near Stadlandet in Sogn og Fjordane County, where the surface is of fine sandy soil more or less mixed with humus, the corn or potato fields after only a few years of cultivation lay several centimeters lower than the surface of the surrounding meadows. Sandy soils are most liable to suffer from dust storms as they quickly become dry on top. Typical bog soil and mould are less liable to be damaged by wind, as they retain moisture better.

Deterioration of the surface soil caused by dust storms is difficult to avoid entirely. Keeping light sandy soils under grass will help somewhat. Tillage must also be carried out in a way that does not waste the moisture.

The loss of soil by erosion will vary greatly from one locality to another, according to topography and the amount of snow and rain. Among the causes of great loss by erosion in the western part of the country is also the fact that the soil

is often not frozen in the winter, and that most of the winter downpour takes the form of rain or sleet. The washing away of fine-grained material from bare fields is therefore continued during the winter when the soil in most other parts of the country is frozen hard and covered with snow and consequently protected against erosion.

There has been no comprehensive investigation regarding the quantity of soil lost by erosion. Røyset, however, has made some observations which show that the loss by erosion in the western country may become considerable in the course of the winter season. For one thing, he has found that the loss increases with the increase of the angle of slope, and that it consists of light humus particles and fine sand. During the period November to May 1946-47, he noted a loss of 0.12 percent of the depth of the plow furrow in a field of bog soil with a slope of 1 in 40 to 50. In a field of sandy soil, rich in mould, with a slope of 1 in 12, he noted a loss of 0.22 percent of the depth of the furrow. The rainfall during this period amounted to 637 millimeters—somewhat less than usual.

What can be done, then, to prevent erosion of soil in western Norway? As mentioned before, the causes are principally topographic and climatic, but the extent of the loss of soil also depends on the scheme of farming. If the fields are much under open crops and little under grass, the loss will be great. Naturally, some potatoes, root crops, grain, and vegetables for consumption on the farm must be grown in the west, too, but the seasons of open crops must be few—preferably not over 2 or 3 years at a stretch; meadows or cultivated pasture may be kept going long—well up to 10 or 12 years—without turning the soil. With the abundant rainfall there, it is not at all difficult to keep the meadows yielding plentifully by means of manuring.

With regard to the actual tilling, it may be mentioned that unplowed potato fields have proved particularly liable to erosion. In the years when the soil is used for open crops, the plowing should be done in the autumn and, preferably, across the slope. Some soft soil will, of course, be washed off the top edges of the upturned sods, but this will gather in the furrows and will not be carried away. During the spring tilling it will again be worked into the plowed-up stratum. In very steep places the whole of the plowed-up layer of soil may slide downhill during

heavy rains, but such steep slopes should not be used for open crops at all.

And now a few words about plant nutrients being washed away with the drain water.

From Trøndelag, Braadlie has found that the quantities of plant nutrients annually carried away by drain water from tilled clayey soil and tilled bog ranged from 30 to 40 pounds of K_2O , 200 to 370 pounds of CaO , and 15 to 20 pounds of N per acre. The loss of P_2O_5 , however, was very small. The two fields investigated were situated on flat land, the rainfall during the years varying from 633 to 772 millimeters.

Braadlie has found that through the six rivers that run into the Trondheimsfjord alone, the sea receives during a year over 14,000 tons of nitrogen. The quantity of N , quoted in milligrams per litre of river water, varied for the six rivers concerned from 0.6 mg. to 0.8 mg. per litre.

We have so far been considering the *natural* causes of destruction or deterioration of the surface soil. It was mentioned above that the destruction of soil may also be due to *social* causes. Under this category we have here in Norway a form of soil destruction that is due to unregulated production of peat fuel. As peat forms a fairly large portion of our fuel supply, 10 percent of the population in Norway using it for fuel, we shall go into the disadvantages involved in this industry and into the measures taken to stop or limit the destruction of soil by peat making.

In the coastal regions of western and northern Norway, where there is little forest, peat is the most important fuel. This has been the case for centuries. Because of this, the sources of good peat have been reduced greatly in many districts. The peat in the coastal districts often rests directly on rock without loam, sand, or gravel between the rock and the layer of organic material above. The removal of peat therefore transforms the land into ponds or swamps. In the course of time great areas suited for cultivation have been destroyed in this way.

When the peat has been cut, turf from more or less dry ground is utilized for fuel; that is, grass turf and heather turf. In this way, the surface humus layer is removed and the underlying mineral soil exposed to erosion. The mineral layer that is left behind is usually too shallow or too coarse-grained for any production. On the other hand, the ground might be used for grazing or for forest, if the upper layer were allowed to remain.

To those with little knowledge of these coastal districts it must seem an unwise policy to permit the soil, upon which the future existence of the population depends, to be used for fuel. The inadequate income of the population does, however, forbid the importation of fuel from other districts.

The problems connected with these questions have been discussed many times in county congresses in the last 30 to 40 years. In 1936 *Det norske myrselskap* (The Norwegian Peat Society) took up the same questions, and a soil conservation committee was appointed by the Department of Agriculture with the author as chairman.

This committee was given the task of investigating the extent of soil destruction. In addition it was charged with formulating plans to correct the adverse conditions found, to help avoid further soil destruction, and thus solve the fuel question.

When the war broke out in the spring of 1940, the collection of material for such a plan was practically completed and six reports already had been issued. During the German occupation the work of the committee was hampered and the final reports were not issued until the war was over.

The committee has issued 10 reports in all. The first 9 consider questions of more local interest. The tenth report, published in June 1946, gives a summary of the investigations into soil destruction and also proposes measures which the committee thinks must be taken to halt soil destruction. In this report is also included a proposal for a bill covering soil conservation.

From Rogaland County in the south to the Russian border in the north, there are 110 coastal rural districts affected by soil destruction. In these districts the total area of destroyed or damaged soil amounts to about 13,700 acres. Each year the destruction amounts to about 250 acres. These figures are based on data available for the years before the last war.

The following proposals of the committee are all based on the principle that the population must be made self-supporting:

1. An efficient information service regarding the production of peat required.

2. Subsidies for the building of peat-transport roads to distant peat sources, and for other cooperative enterprises necessary for the utilization of larger areas of peat.

3. The establishment of peat inspection in conjunction with certain amendments to the law.

4. Extensive support required to supply electricity in the coastal districts.

5. Extended production of wood in connection with cultivation of pastures.

6. Legislation for soil conservation.

The proposed bill for soil conservation prohibits destructive digging of peat. It specifies certain minimum limitations as to the thickness of the layer of peat that must be left when excavation has been completed. The thickness of this layer varies according to the nature of the inorganic matter in the subsoil and the future use to be made of the land. The bill also includes regulations for the general use of peat land and also for the burning and removal of heather. The proposed legislation was enacted into a national soil conservation law by the Parliament in March 1949.

To sum up I will say: All our endeavor must be directed toward the conservation of the soil; that is, the plant-nourishing and the plant-producing component of the loose layers in the earth. To a country as poor in soil as is Norway, and partly unfavorably situated as to climate, the soil becomes particularly valuable. We must, therefore, see to it that the waste of soil is stopped; otherwise, conditions in several coastal districts will become steadily more difficult so that in the end we shall be confronted with problems which are nearly insoluble.



EVIDENCE ON DISPLAY.—The Orleans County (Vt.) Soil Conservation District is purchasing sites and setting up a series of small roadside demonstration areas to help educate farmers and public on the value of development and management in forestry. The first site, 1½ acres, is on the main highway between Westfield and Lowell. Others are to be located on principal highways. The SCS technician, county forester, and the vo-ag pupils and teachers in local schools are cooperating. The vo-ag groups will do the planting and other work on the tracts, under direction of their instructors, and Roger Beadle, the SCS technician at Newport, and Warren Drown, Jr., Orleans County forester.

EVERY YEAR THEY COME WINGING IN

By WILLIAM B. LITTLE

Photographs on back cover

CANADA geese, often regarded as the wildest of wild birds, are not wild at the Lockhart Gaddy goose pond, Ansonville, N. C. Geese, wild or tame, are reputedly dumb creatures. Here, again, the winter visitors to the Gaddy pond upset the generally accepted ideas about geese. They do have sense.

The decoys were real but home-grown Canada geese. One wing of each was clipped in winter and they stayed on and around a 3-acre fish pond when not being used for hunting. A few migrating geese joined them. These came back year after year and brought others with them.

On the day before Thanksgiving in 1949—the day before opening of the hunting season for geese in North Carolina—6,000 were counted here.

Gaddy is able to make accurate counts because of a habit the geese have of feeding on fields of small grain. On moonlit nights the geese are through feeding and begin to return to the pond at dawn. They come in groups. Using a field glass, Gaddy can see each group far enough away as they come in to count them all by the time they reach the pond.

Live decoys are now outlawed in North Carolina. However, approximately 1,000 of the geese reaching the Gaddy goose pond in late September and October are killed by hunters. A few cripples manage to walk back to the safety of the refuge. Some of these recover in time to fly North in the spring. Others, with badly broken wings, stay on as more or less permanent residents.

A few are crippled in a way they can be recognized from year to year. Gaddy knows of six which have been regular visitors the past 10 years. There are probably others which have been coming for a much longer time.

Mrs. Gaddy pays close attention to the crippled. One had both legs broken and moved on land with great difficulty. On seeing Mrs. Gaddy it would

rise from the water and fly close to where she stood. She always saw that this one had plenty to eat. One day on reaching the pond, she found it dead at the edge of the water. It hadn't quite been able to climb out on the bank.

Grain fields within a radius of 20 miles are grazed by the geese. They usually select the larger fields where they can feed out of gun range from the wooded edges. Farmers don't complain of damage to small grain. A few believe it is improved by being clipped, or by the droppings of the geese.

It is an unusual sight to see wild game birds here where they are not afraid. The newcomers are shy to an extent, staying somewhat removed from the place where the daily ration of corn is put out.

Gaddy grows 80 acres especially for them. Still, that isn't enough for a season. He buys some corn and has a contract with a bakery to take all stale left-over bread. This amounts to about 75 pounds per day.

Feed runs into money, so during the past several seasons Gaddy had charged a token fee of 25 cents each for visitors. People have come from as far away as Canada and from most of the States in this country. Here they see a truly interesting and unusual sight.

The geese follow Mrs. Gaddy around like chickens. On a foraging trip to graze they are wild, back at the pond they immediately become tame again.

It is reported by the Soil Conservation Service that more than 167,500 farm ponds have been provided in the United States as a result of their inclusion in conservation farm plans. In addition to their many other values, these ponds add immeasurably to the Nation's fish and fowl and game resources.

HUNDRED-ACRE CLUB.—The Suwanee River Soil Conservation District in Florida has a new kind of club, reports C. P. Anderson, president of the Florida Association of Soil Conservation District Supervisors. To be eligible, a farmer must have 100 or more acres of improved pasture. So far, there are five members.

OFFERS SCHOLARSHIP.—Middlesex County (Conn.) Soil Conservation District is sponsoring a scholarship to the fifth annual conservation workshop held at the University of Connecticut July 23 to August 5. Two college courses in conservation will be offered for credit. The scholarship will go to a Middlesex County teacher.

NOTE.—The author is soil conservationist, Soil Conservation Service, Wadesboro, N. C.

DRAMA ON WHEELS IN EL SALVADOR

By FORD M. MILAM



Manuel Chávez, in foreground, explains train exhibit to Camilo Arévalo, Minister of Agriculture. Note water being applied to plots from perforated pipe at left.

"HAD I known 10 years ago about soil conservation practices such as these, not only could I have saved my farm but I would have made a fortune out of it," exclaimed one Salvadoran farmer at the recent exposition of the *Centro Nacional de Agronomía*, cooperative agricultural

NOTE.—When this article was written the author was head of the department of agronomy, Centro Nacional de Agronomía, Santa Tecla, El Salvador. From 1939–41 he was cooperative agent, SCS and West Virginia University. From 1945–48 he was director of agricultural education and research, South Korea. Mr. Milam now has taken up a new station in New Delhi, India, where he will be adviser to the government on agronomy under a point-four type assignment.

experiment station of the United States and El Salvador, at Santa Tecla, El Salvador.

He was one of thousands of farmers who for the first time saw with their own eyes the great difference in soil and water loss from proper and improper farm-management practices. The Centro exposition took place at Santa Tecla November 25–27, 1949, and was taken around the country by train in February 1950. Unanimously the visitors agreed that the exhibit showing soil and water loss from runoff plots was the high light of the entire exposition. The soil conservation exhibit was planned by the author and Manuel Chávez



Terraces on steep land near Santa Tecla, El Salvador, 1949.

Viaud, chief, soil conservation section, department of agronomy, and constructed by the Centro's agricultural engineer, Jeff E. Flanagan. The runoff plots consisted of eight boxes, 1 by 0.50 meter, placed on a 25-percent slope which could be subjected to artificial rain. Miniature examples of the following management practices were shown:

1. Coffee protected by bench terraces.
2. Corn between grass barriers on the contour.
3. Strip cropping (corn and legumes).
4. Grass mulch over the entire plot.
5. Land in good pasture sod.
6. Coffee being produced without any protection from soil and water loss.
7. Corn planted up and down the slope (common in El Salvador).
8. Gullies and their control by the use of brush, rock, and log dams.

By means of a perforated pipe connected with the main water system at Santa Tecla (and pow-

ered by a pump during the subsequent railroad tour) Chávez was able to turn the "rain" off and on at will while visitors saw the water either run off quickly, carrying with it valuable topsoil or, in the case of properly managed land, infiltrated into the soil and emerging clear with little soil and water loss.

Chávez, known as the Hugh Bennett of El Salvador, studied in the United States with the Soil Conservation Service under the program for foreign students. During the entire exposition, he demonstrated methods taught in the United States which could be applied in El Salvador. He explained, too, the tanks used to determine soil and water loss, the infiltration studies, the effective vegetative covers, the terracing, diversion ditches, grassed water spillways, grass barriers on the contour, and the reforestation of steep lands.

Such soil conservation practices are particularly needed in El Salvador because the Central

American republic is densely populated and has a low percentage of arable land. The high land pressure thus created necessitates the most advantageous utilization of the available area.

Though hundreds of visitors came to the station during the exhibition, in response to many requests the entire Centro exposition was put on four boxcars and toured the country by rail, thus reaching more than 30,000 Salvadorans. Many methods of visual illustration were used: Actual samples of the crops and products under study, colored graphs, photographs, and a miniature model farm showing best distribution of buildings and fields. Salvadoran technicians, trained at the Centro, conducted the exhibition, once it was ready, and explained to farmers the tremendous differences in loss of topsoil and water through proper and improper management. For instance, they heard that when normal topsoil was lost through erosion, yields of corn crops in El Salvador fell to 6.2 bushels per acre as compared with the 48.7 bushels produced on a farm properly managed.

As he left the exhibition, one large coffee producer commented, "This is the finest piece of work the Centro has done for El Salvador. And what's best of all, this exhibition doesn't really need explanation. It tells its own story."

SEED ALONE PAYS BILL

(Continued from page 26)

lish 5-acre observational plantings in every county in a soil conservation district in the Southeast.

The year each crop was introduced in the district program, and the acreage, quantity, and value of seed harvested in 1949 are shown in the following table:

Crop	Year introduced	Acreage	Seed harvested	Value
		<i>Acres</i>	<i>Pounds</i>	<i>Dollars</i>
Caley-peas-----	1944	15,000	150,000	15,000
Buttenclover-----	1945	3,000	90,000	45,000
Tall fescue-----	1946	10,000	315,000	157,000
				217,000

The supervisors estimate the value of seed harvested of "all crops used in carrying out a good soil conservation program" at over \$400,000. As further indication of progress, they point out that farmers cooperating with the district, as compared with accomplishments in 1948, achieved the following results in 1949:

Improved 8,582 acres of pasture—90 percent increase.
Seeded 5,767 acres of pasture—111 percent increase.
Drained 2,423 acres.
Excavated 20 miles of drainage channels—233 percent increase.

Planted 1,127 acres of water-disposal areas—103 percent increase.

Planted 2,850 acres of sericea—166 percent increase.

Planted 3,107 acres to alfalfa and perennial grasses—295 percent increase.

Commenting on what the district program has meant to cooperators, Carl T. Jones, of G. W. Jones & Sons, a district cooperator in Madison County, said "on-the-ground land-use planning" had been of material benefit on their farm because crops were in all cases suitable to the land.

"We now have 650 acres of certified Suiter's grass (Kentucky 31 fescue) of which we are quite proud," Jones commented, "but in establishing these plantings many problems arose which, but for the assistance of the Soil Conservation Service, might have proved disastrous."

BARTE of NEW MEXICO

(Continued from page 32)

Association of Soil Conservation Districts, Barte attended the National Association meeting in Atlanta at his own expense. There he and various western conferees devoted most of their time to planning a program to get Federal and State agencies controlling public lands to carry out proper conservation measures on the public domain.

"The Federal and State Governments urge farmers and ranchers to conserve soil, so why shouldn't these same agencies practice conservation on the lands they control?" Barte asked.

Following the Atlanta meeting, Barte and his associates went to Washington for conferences with chiefs of Federal agencies handling public lands. They proposed that appropriations be made to establish conservation programs on the public lands, and that the work be carried out in cooperation with soil conservation districts.

"Our proposal was favorably received, and the agency chiefs said they were willing to work with districts," Barte reports. "However, it was too late to get the necessary appropriations this year, but we are hoping for success next year."

Lee Barte has had a colorful career since stepping into his father's shoes. He somehow finds time for such things as photography, fishing, and hunting. He holds a lieutenancy (JG) in the Naval Reserve, is a member of the Reserve Officers Association, a member of the agricultural board of the Albuquerque Chamber of Commerce, a member of the advisory board of the New Mexico Game Protective Association, is active in the Farm Bureau, and is a member of the Presbyterian Church.

—VIRGIL S. BECK.

BUILDINGS OR FARMS?

By HENRY C. LINT

ONE Saturday afternoon Bob Anderson (now agricultural attaché in Prague) and I went shopping for phonograph records on Kurfürstendamm in Berlin. In one of the stores we ran into Ericka, a salesgirl unusually well versed in phonograph records. After about two revolutions of any record she could tell the selection, the artist, and all other particulars. After we got to know her, Ericka would bring records out to our house, play them, and take back the ones that didn't suit our taste. Incidentally, the chance to get a good meal may have had something to do with the super service.

No records explaining land capability have been stamped out by Telefunken or Electrola, but indirectly my interest in records resulted in one of my best lessons in land capability. To show her appreciation for our purchases and possibly the meals, Ericka once invited me out to her house for Sunday dinner. Her parents' home was on the far side of Russian-occupied Berlin, fully a mile from the elevated station and on the very edge of open country. Her family had a plot of ground about 40 by 125 feet and every square inch was planted to some sort of edible plant. Two 20-foot rows of corn spelled the possibility of supporting a few chickens. One less rabbit inhabited the pens that Sunday than the day before. Ericka's mama turned something really tasty out of Br'er Rabbit—as nice a meal as I ever had. (You can guess who supplied the coffee and the sugar for the cherry pie.)

Their sandy loam soil was "A" slope and might rate green, certainly yellow, by our chromatic scheme of portrayal. But capability there wasn't measured in terms of economics, profits, or permanent agriculture. Production spelled the capability of staying alive. The capability of the window boxes in prewar times was probably to produce four geraniums, but under 1946 conditions, its capability was three or four messes of string beans. One has to see front lawns of \$75,-

000 homes turned into potato patches, and tomatoes growing on the island between a pair of streetcar tracks, to appreciate that land capability is synonymous with the possibility of existence.

It's probably the Berlin background, with recollections of the trip back from Ericka's, that makes me know "valuable" isn't the right word for land. "Precious" is better. I've ridden New York subways for years and thought I'd seen everything by way of crowding. But if you'll picture the same number of customers per car as in New York, and then imagine each passenger with a rucksack full of lettuce, beans, and what-have-you, then you can appreciate the ultimate in coziness of travel on the U-Bahn. Friends in need and friends indeed wasn't merely a line of poetry to the Berlin mid-city dwellers and their suburban acquaintances; land use wasn't simply the basis of physical nourishment. Its roots went down to the deepest emotions of love and gratitude that only people in need can begin to fathom. Once you see the true connection between soil and existence, you realize that the man who allows his land to wash away isn't just a poor farmer—he's at least a saboteur.

Working now in a soil conservation district where it is only 5 miles from the office to the George Washington Bridge and 25 minutes to Yankee Stadium makes me sense how priceless could be the capacity of our soils to produce if ever New York should become such a fearsome sight as is the German Capital today. Berlin, with its 3,000,000 people, surrounded by fairly good agricultural land in all directions, would be a gourmet's paradise compared with metropolitan New York's 10,000,000, under duplicate conditions.

Twenty-five years ago, there were cornfields at Jackson Heights on Long Island. It's not more than 4 miles from the Fifty-ninth Street Bridge. The inevitable happened. Today, five-story apartments occupy the site. That land no longer has the capability to produce food. Within the past few years, Bergen County in New Jersey has been the scene of a tremendous building program. Whole farms have vanished before the bulldozer and the builders' tools. True, people need homes, but with my recollections of land capability as the only antidote for starvation I'm wondering whether or not we are sawing off the limb we're sitting on.

If we were to take a long-range view of land capabilities, maybe we would say that the green

NOTE.—The author is district conservationist, Soil Conservation Service, Hackensack, N. J.

land and the yellow land and even the red land need to be kept in farms, if only as insurance against the worst eventualities. The reason the real-estate developers prefer the nice open farm land is that the initial costs are lower. Class VII land is sometimes better from a scenic standpoint, but blasting cellars out of solid rock, clearing trees, and bringing in soil is expensive. Laying gas and water mains costs more, too. If we could but develop a consciousness of how priceless the first three classes of land can be under certain conditions—which Heaven forbid may ever be visited upon us!—then maybe location of the good land we are conserving for future generations might be an additional consideration in planning. An acre of Class III land, 5 miles from a city, is worth many times as much as an acre of Class I land 50 miles away when there is no transportation.

Just as a city's zoning laws now classify areas for business, manufacturing, or residential uses, so perhaps the town fathers some day may decide that John Doe's farm has too high a capability for food production to permit it to fall to the bulldozer and the building contractor. Now, you may begin to see why anyone would almost have to serve an apprenticeship in a war-torn area and then be plunked down in a metropolitan soil conservation district to get excited over such aspects of land use and misuse.

One feature of the land-use picture that also is most important in metropolitan areas is monetary values. It's difficult to turn down \$100,000 for 20 acres but I know two farmers who have done just that. It's not that they are holding out for more money, it's because they want to keep on farming land that has been in the family since some remote ancestor bargained it out of the Indians. These two are notable exceptions.

Another aspect of metropolitan agriculture that serves to drive people from the farm is taxes. Thanks to heavy building developments roundabout, a parcel of farm land automatically is burdened by appraisals and assessments out of all proportion to its agricultural earnings. Farms get taxed unrealistically for water mains and sewers installed along their frontages. A trunk sewer line can easily be the last straw. One of our supervisors has to pay \$75 an acre in taxes before he even starts farming operations. One arm of government helps him to grow things efficiently and save his soil, while another more or less unconsciously operates to drive him out of business.

In some places the farmer does have a slight preferential treatment from the tax assessor but, even there, the sound reason for so treating farm values should be due to a universal appreciation of land capabilities, not merely an accidental finding of an assessor who happens to know something about farming. Some day those good acres that are still left in farms conceivably might have a value in sustaining the population out of all proportion to any dollar value. One has to see supposedly valuable jewelry converted into a few pounds of butter to know what things are really valuable when things get rugged. There are no calories in Meissen china.

In the army one learns the meaning of logistics and gets an insight into the tons and tons of material that must be moved to support a fighting unit. Recalling all of the difficulties we encountered in trying to move something like 100,000 tons of potatoes from Bavaria northward over a disrupted railroad system makes me anything but envious of a military commander with a hungry New York on his neck and food supplies from the west cut off.

Of course, we have many acres in the Northeast Jersey district that could be thrown into some sort of emergency production of food. The presently cultivated areas would suffice to feed the population of the district less than 2 days of the year.

It is not inconceivable that our land-capability maps one of these days will help to blueprint urban expansion. Someone will look at the map and say "This green, yellow, and red land simply has to stay in farms." In appreciation of the true value of good land, it then will be said, "Build your houses and factories on the Class VII land."

The first line, as well as the last line, of defense—to this conservationist—is where good acres equal population needs.

COWS LIKE SERICEA.—In some areas where sericea is not generally known, farmers think livestock won't eat it. When farmers held a meeting recently in the Greenmount section of the Laurel County Soil Conservation District in Kentucky there was on exhibit a bale of sericea hay that had been cut at the proper stage. Several farmers took some of the hay home with them to see how their stock liked it. At the next meeting, all reported their livestock ate it greedily, one reporting that his cattle ate it in preference to annual lespedeza.

Willie Cornett, a supervisor of the Clay County Soil Conservation District, recently observed that although he had had his cattle on sericea only a short time he could tell they were putting on weight.

REVIEWS

OUT OF THE EARTH.—By Louis Bromfield. Harper & Brothers. New York. 1950. 305 pp. Illustrated. \$4.

Like a May morn at Malabar, Bromfield's latest land book comes crisply fresh and stimulating. It is a book of ideas, experiences, and convictions with a wee dash of vinegar—a forthright product of farmer, scientific reporter, and patriot.

There is much substance in "Out of the Earth." Its writing contains the charm and sustained interest of a great novel but there is in it also the stern quality of annotated history—the gain-by-gain story of a vast countryside (notably the South) returning to beauty and productiveness.

Louis Bromfield's own Malabar Farm is, of course, a prime example of once-barren fields now lush and healthy, an 11-year transformation brought about by methods which Nature approves. Its acres have been protected from erosion, fed with organic materials, guarded against misuse and overuse, given the benefit of the latest and best management methods. Malabar's good steward has applied here the choicest ideas stored up during his extensive ramblings in this and other countries. He has adapted as readily a good European drainage practice as a good grass-legume mixture developed in the United States. The clear streams and the deep, cool swimming pools he knew as a boy have returned to Malabar. The roots of his alfalfa penetrate the soil as deep as 12 to 15 feet. His cattle thrive on a minimum of grain feeding. All life on Malabar—plant and animal—conveys an impression of well-being that belongs to an agricultural husbandry that is intelligent and dutiful.

Occasional sinners will find fault with "Out of the Earth." It pokes at lazy and inept and red-tapish government. It draws conclusions, at times, with a light-heartedness at variance with the traditional style of orthodox research. But there is no gainsaying the results obtained at Malabar, or the value of the Bromfield impulse all over the United States. There is a disarming blend of humility and pride in Louis Bromfield as he extends the Malabar pattern to yet another tract in Texas. There has been too little comment in the press on the importance to the soil conservation movement of Bromfield's missionary achievements in business, agricultural, and cultural circles, and particularly through the appeal of his writings. He has won his popularity through high personal character and dedicated service. In fiction and non-fiction, on sound screen, as an accomplished speaker, he reaches millions with his message of land regeneration. "Out of the Earth" is a book that will, and should, be read by the banker and his wife, by the college sophomore and his chemistry teacher, by the chamber of commerce manager and his secretary. It should be read and pondered by every dirt farmer, wherever he lives.

Bromfield's work is always rich in lights and shadows, but for good measure he includes a 32-page section of mag-

nificent photography, mostly by Joe Munroe, which helps to nail down his testimony.

If we will but give heed to the story he tells, we may very well share the author's cheer: "The good farmer of today can have all the good things that his father knew and many that his father never knew, for in the modern world he lives with all the comforts of a luxurious city house plus countless beauties and rewards forever unknown to the city dweller." —WELLINGTON BRINK.

RURAL SOCIAL SYSTEMS. By Charles P. Loomis and J. Allen Beegle. Prentice Hall, Inc. New York. 1950.

Here is a book, the first in fact, which presents essentially the same concept on which the work with "neighbor groups" in the Soil Conservation Service has been based. Loomis and Beegle, with firm conviction, believe that the group of greatest importance next to the family is a small, informal group, which they term the clique, informal friendship, or mutual-aid group. The groupings are based on friendship developed at work, play, or other types of interaction. In case of misfortune the members of such groups are the first to offer assistance or consolation and in the case of attainment or good fortune they offer congratulations and praise. The most important of the characteristics are the unlimited responsibility of one for all and all for one, and the solidarity which results from converging sentiments and interests.

The authors point out that in view of the tremendous importance of these groups it is difficult to understand why so little attention has been given to them by rural sociologists. They point out that perhaps part of the explanation is the great variety of groups and the many terms by which they are known. People commonly refer to such groups as their "crowd," "set," "neighbors," "friends," "group," and so on. Another reason they have been ignored is because, like the air, they have been taken for granted. Also rural sociologists have placed great reliance on the categorical questionnaire or field schedule, particularly in locating the so-called "neighborhoods," which technique has tended to bound such "neighborhoods" geographically and thus ignored the clique or friendship group. Almost all American rural sociologists place great stress on what they call the "neighborhoods." Most of them consider it a locality group, geographically bounded but also having the nature of the friendship or clique group. The authors comment that rural sociologists of the past have been very unrealistic in considering "neighborhoods" as synonymous with cliques, friendship, or mutual-aid groups.

Loomis and Beegle point out that often in the past rural sociologists have talked of the necessity of finding "handles" with which to work with the people in farming areas. Beginning with the early investigators, who invented techniques for studying and describing locality groups graphically, rural sociologists have thought that these groups were the "handles." Dozens of bulletins have been written about such "neighborhoods" and other locality groupings, but few thought of looking for the most useful "handle," the leader of the clique or friendship group.

The authors tell of a number of studies in which these informal groups have been identified and described. Of

one such study conducted in a county in Michigan they say that although no "neighborhood" delineation specialist can find neighborhood locality groups in a large proportion of the county, anyone can find cliques and mutual-aid groups everywhere. The leadership of these groups is stated as being very important for successful education or promotional work and for the administration of action programs.

On pages 681 to 687 the work of the Soil Conservation Service along these lines is described. In addition, the book includes a wealth of information about "neighborhoods," communities, and other phases of rural sociology.

This book should prove invaluable to agricultural workers as a guide to developing effective methods for understanding and working with rural people and their leaders in educational and promotional activities, and particularly in administering action programs.

—H. W. REAM

RAISING GAME BIRDS IN CAPTIVITY.—By David B. Greenberg. D. Van Nostrand Co., Inc. New York. 1949. 224 pp. Illustrated. \$4.95.

This book comes from an especially well-qualified author. He was formerly professor of poultry husbandry at New York State School of Agriculture and has had practical experience on his own game farm for 9 years. This experience, plus the fact that he has procured material from many sources, including universities, State game departments, and commercial breeders, has resulted in a book which furnishes complete and up-to-date information.

The author has explored in detail and given a description of the various methods of raising game birds from the mating of the adults to the final disposal of the product. He not only covers the better-known upland game birds but also devotes an entire chapter to waterfowl. All phases of game-bird raising are discussed, including artificial incubation and brooding, natural means of hatching and rearing, nutrition and feeding, as well as many others.

Generally, biologists, in making recommendations to farm planners, place less emphasis on stocking of game birds than does the author. The trend of modern game-bird management is more towards habitat improvement and better regulation of the kill. However, soil conservation practices which benefit wildlife habitat on the farm very often prove fruitless because of the lack of a source of game-bird seed stock, either natural or artificial. For this reason alone the information available in this book will be of value to many farmers who are interested in producing game birds on suitable areas on their farms. Not only can birds be produced for stocking an individual's own farm by applying the methods described, but surplus birds can be raised for sale. Thus, an additional source of income is provided, which is always desirable in modern diversified farming.

—MERLE A. GEE.

APPRECIATION FOR CRAIG.—Cooperating farmers of the Greenwood (S. C.) Soil Conservation District presented Johnson Craig, work unit conservationist, a fine wrist watch during their celebration of the district's tenth anniversary. Craig was praised for his 10 years of valuable service to local farmers.

NOTES FROM THE DISTRICTS



Winners: The Center Conservation Neighbor Group, which captured vetch-planting prize.

VETCH CAMPAIGN.—One day in the summer of 1949, Gene Foster, vocational agriculture teacher, hit on an idea for getting more cover crops on peanut land in north Texas. The supervisors of the Upper Elm-Red Soil Conservation District and the merchants of Whitesboro got behind it.

Signs—"Let's Plant Vetch" and "Ask Your Neighbor About Vetch"—went up in all the business houses at Whitesboro. Car stickers on windshields proclaimed loudly, "For Land's Sake, Plant Vetch!"

The slogans captured the imagination of farmers from the Red River to Tioga and from Southmayd to Calisburg. When the final count was taken last fall about 8,000 acres of vetch had been planted on sandy peanut land where only 500 acres had been planted before.

Prizes donated by Whitesboro businessmen went to the neighborhoods that planted the most vetch. The Center neighbor group won first place. The group received 200 pounds of phosphate and seed sufficient to plant 10 acres of vetch on one of the farms for seed production. Other winners were Dixie, Sadler, and Emerson Chapel.

Whitesboro plans another vetch-planting campaign this fall. This time they expect farmers to double the acreage.

CITY FARMERS.—Eight businessmen in Davenport, Iowa, who also own farms, have formed their own farm-planning group for easier cooperation with the Scott County Soil Conservation District. Living in a town of nearly 100,000, the businessmen cannot form a neighborhood group in the usual sense. So the planning meetings are preceded by a dinner at a club where the group gathers.

The 8 landowners, representing 10 farms in the district, are enthusiastic about their conservation plans. They have selected Lloyd Platt, a commercial nurseryman, as the group's leader. Most of the farm operators attend with the owners.

Other businessmen who own farms are becoming interested in forming similar planning groups. They take part in discussions more readily than when they are among rural groups. They can also attend regularly because the meetings are adjusted to their convenience.



BANKERS BUY SUBSCRIPTIONS.—The Monroe County (Wis.) Bankers Association is providing funds to defray costs of subscriptions to Soil Conservation Magazine for all 1950 soil conservation district cooperators in its territory.

PLANES SEED CALEY-PEAS.—O. J. Walls, of Guntersville, Ala., used planes to sow 10,400 pounds of Caley-pea seed on 260 acres. The cost was \$1 per acre. Had he stuck to conventional methods he would have been too late for planting. The owner of Hobbs Island had already planted 75 acres on his farm by ground implements when he decided to take to the air.

Hobbs Island, planted to corn each year, needed a winter cover crop. Walls knew this, but late picking and occasional high waters made troublesome the planting of such crops. After talking with farmers and others in the Northeast Alabama Soil Conservation District, he decided Caley-peas would be his best cover crop because of their habit of reseeding themselves.

By letting a different field of peas mature seed each year, Walls figures he will soon have volunteer stands on the whole island, thus making further seeding unnecessary. Pasture and livestock are included in his complete soil and water conservation plan.

RECLAIM FIRE-SWEPT AREAS.—Two Maine soil conservation districts—Oxford and York—have started to reclaim 260 acres in the 1947 fire-swept forest areas. The York County district has received a gift of 160 acres from the town of Lyman and has started the planting of young stock. The Oxford County district, given 100 acres at Brownfield by Leon Brooks, a poultryman, will have its reforestation program under way in a short time. Both programs are long-range activities in which replanting will be spread over several years, because the districts operate on a limited budget. In addition to reforestation other good forestry and conservation practices will be applied as a demonstration of what can be done by private landowners through cooperation with the 15 Maine districts.

York County Soil Conservation District got reforestation started when conservation and forestry leaders, Boy Scouts, and forestry 4-H Clubs, working under SCS technicians, planted white and Scotch pines, tatarian honeysuckle, silky cornel, and multiflora rose.

Philip Andrews, chairman of the Oxford Soil Conservation District, says the Brownfield tract will be utilized to demonstrate what can be done to reclaim forest cover and organic matter lost during fires. Practices will include pruning of existing timber to obtain more clear-cut

lumber, thinning and release cutting to allow space for proper growth, and development of fire lanes and woods roads for future fire protection and ease in logging.

Plantings will include multiflora rose for fencing and cover, development of travel lanes for wildlife, wildlife borders, and sanctuaries. Cooperating with the district and SCS in the Brownfield project are State and Federal forest services, 4-H Clubs, Boy Scouts, Future Farmers, and other organizations. The Western Maine Forestry Nursery, Fryburg, is donating odd-lot seedlings.

Strange aspect of the situation at Brownfield is that about the only standing green timber of value in the 100-acre tract was partly flooded by a beaver dam. The overflow saved the trees at the time of fire but now will destroy them unless the dam is removed. Permission for this action is being sought from the State.



Bankers' committee: H. D. Fields, St. Jo; L. O. Gardner, Sherman; Claude Jones, Gainesville (chairman); J. M. Weinapfel, Muenster. Absent was James McCall, of Nocona.

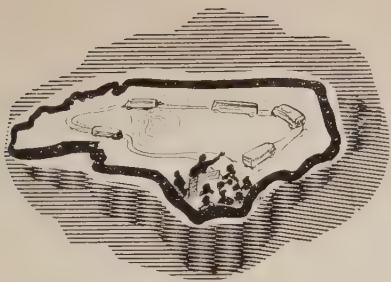
RALLY CITY ELEMENTS.—The 16 banks in the Upper Elm-Red Soil Conservation District in north Texas feel that soil conservation no longer is solely the farmer's job. They set up a committee to work with district supervisors on conservation. Claude Jones, of Gainesville, was named general chairman. Others were James McCall, H. D. Fields, J. M. Weinapfel, and L. O. Gardner, representing each of the five zones of the district.

One of the first moves the bankers and supervisors made was to invite newspaper editors and radio-station managers in the district to a meeting, as a result of which the newspapers and radio stations formed a separate organization in support of the district program.

The district supervisors are working to extend the plan to industrial leaders, the clergy, civic clubs, and other important elements.

Bankers joined with district supervisors in sponsoring an awards program at Gainesville as part of Soil Conservation District Week. They were instrumental in getting the annual convention of the Texas Bankers' Association to adopt a resolution giving the association's active support to the soil conservation district program.

Chairman J. W. Hess and fellow supervisors Ed Blackmon, V. W. Redman, Willard Kemplin, and John B. Rice can take credit as one of the first boards of district supervisors in the country to gain support of bankers, editors, clergymen, and civic and industrial leaders through group organizations.



SPEAKERS VIE.—A total of 625 Negro high-school students took part this spring in a speaking contest on the subject, "The Social Aspects of Soil Wastage," sponsored by the North Carolina Bankers Association in 16 North Carolina counties. One of the rules of the contest was that each contestant must attend a tour supervised by an agricultural worker to observe the effects of misused land. Elimination contests were held within each of the 48 schools participating and at county, district, and State levels. Prizes totaling \$1,925 were awarded.

First prize winner was Joshua Lee Davis, Jr., of Eastman High School, Halifax County, who received \$400 in U. S. savings bonds. Second and third prize winners of \$100 and \$50 bonds, respectively, were Margie Edwards, Patillo High School, Tarboro, and Spargon Fitts, Warren County Training School. S. J. Hodges, Negro Extension agronomist, had charge of the contest.

LEVELING LESSENS WASTE.—George C. Crawford now has a lot more time to operate his 80-acre farm in the Escalante Valley west of Cedar City, Utah. It grew from a dislike of irrigating on the diagonal, which varied the length of his runs.

The nature of his cropping system in relation to his supply of water made the end furrows much shorter than the center. This caused him to lose time and waste water.

On recommendation of SCS technicians assisting the Iron County Soil Conservation District, of which he is a cooperator, he leveled 35 acres after his 1948 potato crop was harvested. Using a tractor and carryall, the cost was only \$41.25 per acre.

In 1949 irrigation time was cut 25 to 30 percent, and he estimated the amount of water used was reduced at least one-fourth. Plans are under way to level his entire farm.

"Considering costs of labor, pumping, and water, I figure that when a farmer can irrigate 35 acres in the time required to water 25 acres of unlevelled ground—using an equal head of water—he can't afford not to level his croplands," Crawford says.

RESEARCH FARM.—In an effort to get local data, a farm where research work will be done in cooperation with Soil Conservation Service has been rented by the Maine Experiment Station. John W. Slosser, SCS project supervisor stationed at the university, has set up equipment there and is ready to operate. The study will seek to determine how much runoff can normally be expected for storage in farm ponds, from which it later will be withdrawn for spraying, irrigation, and other production purposes.

PLANNING 43,000 ACRES.—Directors of the Lewis County (N. Y.) Soil Conservation District have approved the application of the Fisher Forestry & Realty Corp. for the conservation planning of 43,000 acres. Most of this land is in Lewis County, the small remaining portion being in Herkimer County. While the long-range program has development of wood products as its goal, in the earlier years operations will be directed toward recreational improvements. The district will utilize technical assistance provided by the Soil Conservation Service and the New York State Conservation Department. It may be 5 years before the planning job is completed, and as many as 50 years before full establishment of the plan. Long-range establishment is necessitated by cutting operations that normally prevail.



Committee: Mrs. J. Bruce Parks, Mrs. Sherrell Vinson, Mrs. W. H. Hardcastle, Mrs. Jaye Roundtree, Mrs. Jack Kirby (chairman), and Mrs. Elmer Campbell (hostess).

GRASS WOMEN.—When the Bosque Soil Conservation District in central Texas announced a Ladies' Range Day, more than 50 ranchers' wives turned out. Husbands stayed home.

The idea occurred to Mrs. J. Bruce Parks 2 years ago when the district held a range field day for men on the Parks ranch. The womenfolk stayed at the house and barbecued meat for their husbands.

"It ought to be reversed," Mrs. Parks remarked. "We should have a range day all our own and leave the men at home."

Mrs. Jack Kirby, chairman of the committee, helps her husband seed grass from horseback on their range. She's just as proud of a good stand of King Ranch bluestem as her husband is.

Mrs. Elmer Campbell was host on her 17,000-acre place near Morgan. Campbell went along to open gates. The only other men present were SCS technicians assigned to the district. The women kept them busy answering questions about bluestem, three-awn, sideoats grama, bunchgrass, tobosa, Indiangrass.

The district plans to make Ladies' Range Day an annual event.

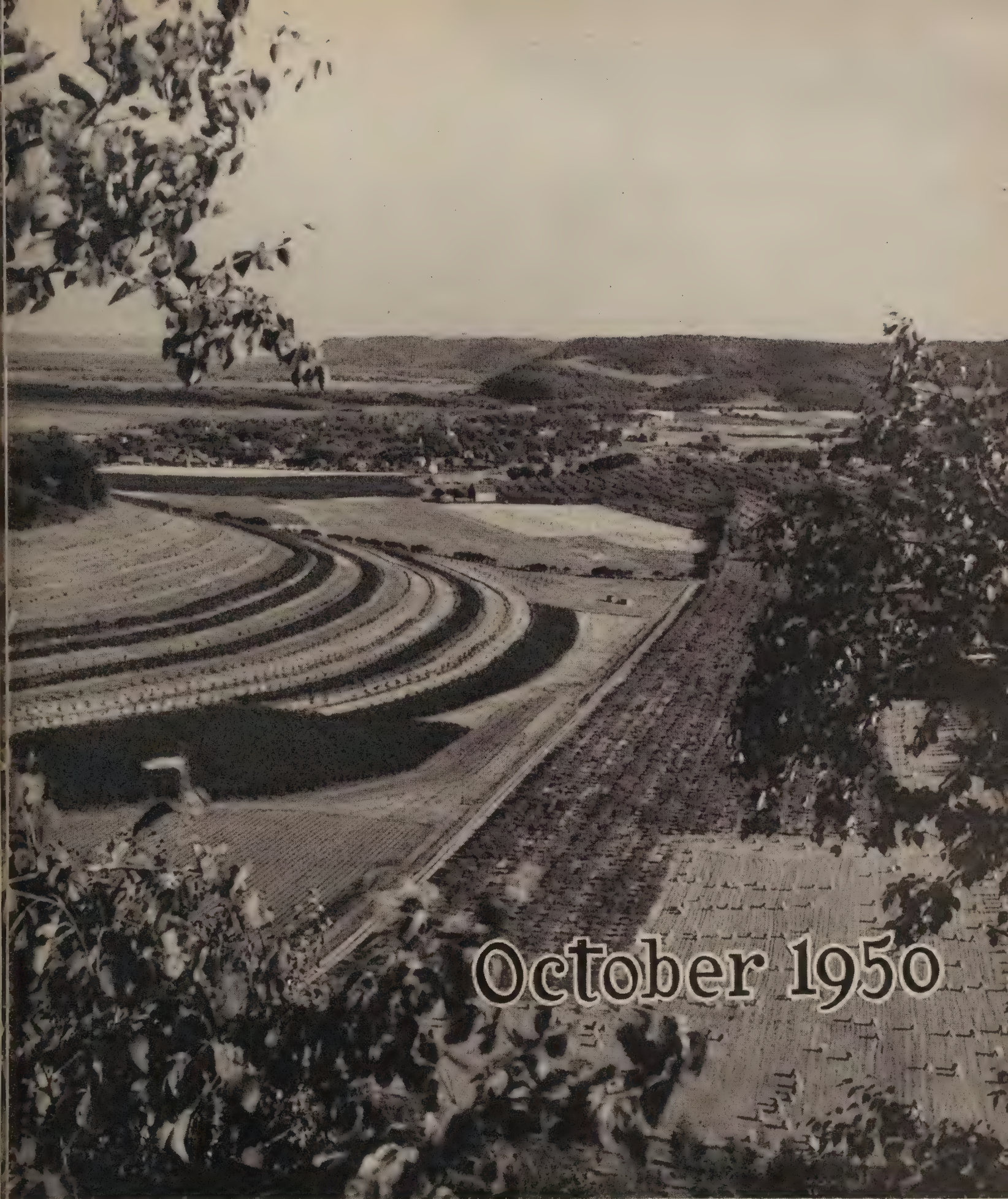


Friends from Canada are welcomed on pond in
wildlife sanctuary established by Lockhart Gaddy

See article on page 38

“Every Year They Come Winging In”





October 1950

Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION •

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SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

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☆ THIS MONTH ☆

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

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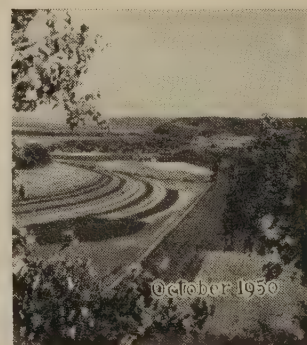


POND LICKED DROUGHT.—No matter how severe a drought ensues, Capella brothers, market vegetable growers in Erie County, N. Y., know that they'll have water for irrigation.

Their 1-acre pond, built in 1948 with the technical assistance of Soil Conservation Service men working with the Erie County Soil Conservation District, saved 4 acres of melons and 35 acres of beans during the long tough dry spell in 1949. The pond is 14 feet deep and cost around \$2,000. "It paid for itself right then," says Carl Capella.

Portable irrigation equipment is used. "On our Vial Road farm," Carl declares, "drought cost us a berry crop that would have paid for several ponds if we had had one over there."

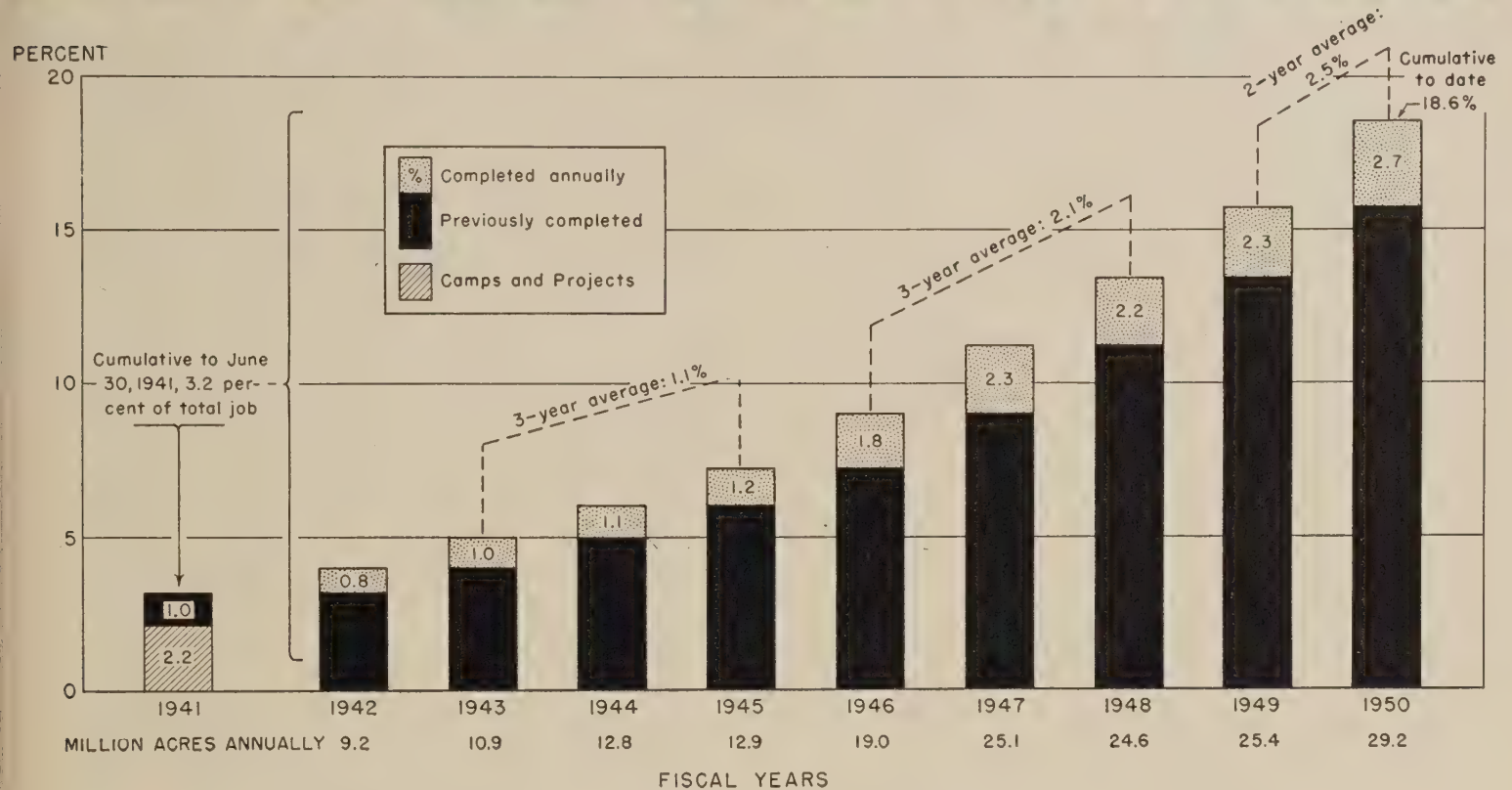
Harvest hands use the pond for swimming. It will be lighted next winter and become a commercial skating center.



FRONT COVER.—The George Nelson farm, in Houston County, Minn., is planted largely to fruit trees and on sloping land the rows are on the contour. Some of the level land is in grain, corn, and truck crops. Photo by Lathrop.

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Progress in SOIL CONSERVATION



By HUGH BENNETT

LET'S get the facts straight on the progress we are making on our Nation's soil conservation job. Once the facts are known, there will be less talk of "slow" progress. The record is an amazing one. All real friends of conservation can be proud of it. And it is getting better every day. The actual chart of accomplishment strikingly reveals the inaccuracy of a careless remark that recently came to my ears: "At the present rate, it will take over a hundred years to finish the soil conservation job!"

Such statements are based on misinformation. The rate of progress is very much greater per dollar spent today than it was in the earlier years, and the trend is steadily upward. On the whole, the soil conservation picture is a cheerful one. This article will tell you just where we stand and

how fast we are going and how long it will take to finish the job up to the stage of maintenance and improvement.

While we admittedly are not moving fast enough and are still suffering heavy losses of soil, we are, nevertheless, moving ahead at a rate that is anything but discouraging. I don't mean that any of us is at all satisfied with present progress; we are not satisfied, and are constantly seeking improvements for accelerating progress. We have greatly increased progress in the past; and I see no reason why we can't continue to build up momentum. It is my belief, given adequate facilities, that we can get the job of applying the basic conservation measures to the land completed by about 1970—around 20 years from now.

This estimate is based on what has been done thus far, together with the continuing upward trend. At the end of the first 7 years of work, in 1941, the Soil Conservation Service had directed the conservation treatment of 26,600,000 acres, an

NOTE.—The author, Chief of the Soil Conservation Service, was assisted by R. W. Rogers of the division of records and reports.

average of 3,800,000 acres annually for the first 7 years.

The total soil conservation job, in 1941, comprised all lands classified as "in farms," or 1,098,000,000 acres (Census 1945). This does not include areas occupied by roads, lanes, farmsteads, etc.

During 1942 the principal conservation measures were applied to approximately 5,000,000 acres (in soil conservation districts); in 1949 the same kind of treatment was applied to 22,000,000 additional acres. *This was an increase of 340 percent—yearly 4½ times as much work done—with operating facilities increased during this second 7-year period by only 43 percent.*

In addition to the conservation measures applied to the land, much farm planning work and many soil conservation surveys were carried out—enough for a healthy backlog of essential preliminary work to avoid delay in the preparation of necessary conservation farm plans.

But there is still a long way to go, and we are still losing great quantities of soil. However, we have learned how to control erosion on practically all kinds of land, and we are controlling it at a much faster rate than the public realizes. The job is being done at a rate so much faster than I ever expected to see, even so recently as 15 years ago, I feel almost jubilant over the progress that's being made.

The figures used in this article are from the records of the Soil Conservation Service. Other agencies, Federal, State, and private, have made contributions, to be sure; but I have not examined their books. The material here relates to the use of needed soil conservation measures on farms for which complete conservation plans have been made on an acre-by-acre basis by our technicians. These farm plans have been guided by the physical land facts revealed in our soil conservation surveys—which no other agency makes.

In considering the rate of progress on so prodigious a job as conserving the productive lands of the United States while using them, a major point to be considered is whether or not progress is speeding up from year to year. This has much to do with an appropriate appraisal of the rate at which any long-time job can be completed.

As to finishing the job, actually there is no end to it, because when the basic conservation measures have been applied to the land there will be the continuing task of maintenance. This is true of

all the works of man. If not maintained, they eventually disappear through neglect.

Our Soil Conservation Service way of conserving soil is markedly different from anything that has ever been done in the whole recorded history of man. It is based on nature's highly successful method of keeping the productive land she builds permanently productive. Nature accomplishes this through the operation of what undoubtedly is the most nearly perfectly balanced program of soil building and soil conservation conceivable. The basic principle of her ideal method is perfect coordination between land, water, vegetation, and animals (with the exception of civilized man).

The closer we can follow this pattern, the better the job will be. Under a good cover of grass or forest, for example, our measurements show that only a trace of soil is lost by erosion, and a much larger proportion of the rainfall is stored in the reservoir of the soil for plant growth. Under these conditions the negligible loss of soil from the surface of the ground is doubtless compensated for by soil building from the material beneath.

So, it is a mandate of nature that the land and the water which makes land productive must be treated and used according to need and capability if the land is to be preserved. I am repeating this concept because it needs all the emphasis that can be given it. Too many people still don't understand that this is one of the physical facts that man cannot change or amend.

For the cultivated crops, our program of modern soil conservation calls for, along with other things, coverage of the land throughout the year with some form of dense vegetation or mulch as much of the time as can be fitted into practical farm practice. Results obtained from our principal conservation practices when used in mutual support of one another (if the character of the land calls for such support) show a degree of effectiveness, as well as can be measured, of something like 85 to more than 95 percent of perfection. The degree of effectiveness will be increased as crop rotations and other measures add organic material and otherwise improve the soil.

In the beginning, our work proceeded slowly, probably more because of its newness than anything else. I proposed the type of program we are using because I felt at the start it was the only possible way to lasting conservation of productive land. I had learned this through continuing study of soils, soil erosion, and land use

1938



Nine years of progress: These aerial photographs of an identical area—about 35 farms south and west of Loganville, York County, Pa.—show how application of conservation practices by farmers shifting from square to contour operations has changed the land pattern.

over a period of 30 years. I had mapped soils in the old Bureau of Soils and later had set up and directed the work of the erosion experiment stations in the Bureau of Chemistry and Soils. Most of the basic data we have relating to rates of soil and water losses for different kinds of land, used for different purposes, as well as the principal erosion-control measures, were developed on these stations. These original experiment stations, and their successors, cooperating with State stations have also developed the great majority of the control measures being used at the present time.

I was sure in the beginning that my proposal for completely coordinated treatment of the land was scientifically sound—that for enduring soil conservation, *treatment of the land on the basis of kind and need* was just as much a physical fact as the fact that water will not run up hill on its own power. In other words, our conservation method was based on the closest possible adjustment with reality, as relating to soil, slope, water, and proper land use.

1947



I understood, also (as the result of 30 years' study of the land), that there was no short cut—no other way—to get the soil conservation job done with any chance of permanency. Farmers, generally, and others, however, had to be shown.

So, in the beginning our progress did not move out very fast. It was necessary to explain every detail of the work to farmers. Now that great numbers understand the program, not so much time is required, generally, for detailed explanation.

During the first 7 years of the life of the Soil Conservation Service—by the end of the fiscal year 1941—the part of the total conservation job completed on the farm land of the Nation (excluding national forests, parks, public domain, and certain other public-owned areas) amounted to only 3.2 percent. This was an average annual rate of less than 0.5 percent. In the fiscal year 1942, eight-tenths of 1 percent of the job was completed. By 1950 the annual rate of treatment had increased to 2.7 percent of the total job; that is, the rate of progress 7 years later was more than three times as fast.

Our figures up to June 30, 1950, show that 18.6 percent of the conservation job had been completed. In addition, there had been a considerable spread of practices to thousands of farms both inside and outside of soil conservation districts, for which we have no records. We have completed, in other words, around one-fifth of the total job; but in considering the results I must repeat, for the sake of emphasis, the fact that *the rate of progress is speeding up*. During the 3-year period of 1943 to 1945, inclusive, the rate of progress averaged 1.1 percent of the total job annually, while for the 3-year period of 1946 to 1948, inclusive, the average rate had increased to 2.1 percent of the total job—about doubled.

It is this last figure showing a doubled rate of progress that is so very significant in any proper estimate of the rate at which the job is being done. I had urged our technicians to double the rate of progress in 1 year. It took 3 years, however, to reach this Nation-wide goal, but progress was doubled in a good many States within the 1-year period.

If we can raise the annual rate of application of effective conservation measures a little more—and this can be done with adequate facilities—it will not be long now until we can begin to see the goal which for so long has seemed so far off.

We are urging the completion of at least an average of 4 percent of the job annually during the coming 3-year period. Nationally, this would mean an average annual rate of around 60 million acres inventoried (surveyed), 50 million acres of farm land planned for conservation, and 40 million acres treated each year during the fiscal years of 1952 to 1954, inclusive. This would be a goal well worth our utmost efforts to achieve. I feel it can be achieved, and that when that's done progress can be still further increased. If we can do this, then the Nation can be assured that the indispensable soil conservation job will be finished on time.

I think it is important to mention the further highly encouraging fact that we could not have done so much work as we have but for the splendid cooperation we have had with soil conservation districts—in which the farmers are working together far more effectively than they have ever done before. Furthermore, we are cooperating with some 30,000 natural neighbor groups in soil conservation districts. We have already gone far enough with this new device (working with neighbor groups) to know how to use it effectively.

And there is still another point in connection with the work which, when properly understood, may be helpful toward a clearer understanding of the vital importance of sound and enduring soil conservation:

Soil conservation of the kind I am discussing is an indispensable part of our first line of national defense. The other indispensable part of our first line of national defense is, of course, strong soldiers, guns, and bullets. The two—adequate food from productive land for adequate defense—are mutually sustaining; one cannot exist without the other. If we lose our soil, there will be little to defend, and only hungry soldiers for defense.

Let's keep diligently on with our efforts to speed up the work; and let's be neither complacent nor despondent. Let's think occasionally like farmers in some of the soil conservation districts, who are beginning to talk about planning proper celebration of the completion of the conservation job in their districts. In 93 districts 80 percent or more of the conservation farm plans have been completed; in 16 districts treatment has been completed by 80 percent or more. Treatment has been completed for half or more of the farms of 105 districts. This is most encouraging. More and more farmers in districts will be looking to the time when their districts can have these celebrations.

I predict there will be no turning back with the soil conservation job, now moving ahead with such gratifying promise. A million farmers in soil conservation districts and under other programs of the Service have now experienced firsthand the benefits that come from practicing soil and water conservation of the modern kind. There was a time when they had to take somebody's word as to whether or not it would pay; but enough of them in a sufficient number of representative places throughout the country now know, out of their own experiences on their own farms, what these benefits are. There is no longer any question, in my opinion, as to whether the conservation program will be continued. It will be, I predict.

There was a time, however, when everything depended on the outcome in hearings before committees and administrative officers, who handed down decisions and directives. The essential elements of that will continue; but from now on, I believe, the case of soil conservation will not be

(Continued on page 68)

DISTRICT PROFILE	HARRY SNAVELY
	of PENNSYLVANIA

Harry Snavely, 79-year-old chairman of the board of directors of the Lancaster County (Pa.) Soil Conservation District, puts men into three classes: "wazzers," "issers," and "willers." Since he partially retired in 1946, he claims membership in the first.

Snavely is still enough of an "izzer" to have taken his first plane ride, when he flew to the 1950 convention of the National Association of Soil Conservation Districts, an undertaking that landed him on the first page of the *Atlanta Journal*.

This Lancaster dairyman has been a front runner in local affairs since the day in 1898 when he started to operate his 119-acre farm. At that time, says W. Martin Muth, district conservationist, young Snavely envied his neighbors' farms; now the neighbors may well envy Snavely. Snavely's place leads in productivity and protection from erosion and soil depletion.

He laid out his first straight strips in 1914, combining them with a good rotation, cover crops, and plenty of manure. A firm believer in the place of good livestock on the farm, he went to Europe that year and imported some of the county's first purebred Guernseys. His 35 milkers average 450 pounds of butterfat and 10,000 pounds of milk per year. These are backed by 25 young replacements and 2 bulls.

Long concerned with community improvement, Snavely saw the need for a soil conservation district. When 15 of the county's 42 townships voted to form a district in 1938, Snavely was elected to the first board of directors. He has served as chairman since 1947, and had one of his fondest hopes realized when the rest of the townships joined the district in March 1950.

But Snavely himself took his own sweet time about a conservation plan for his farm and spent 5 years in careful observation. Others, he felt, needed help more than he. Finally, in 1942 he worked one out with SCS personnel and his farm quickly moved to the forefront. The whole farm has been revamped to accommodate strip crop-



Harry H. Snavely.

ping on the contour. Snavely has relocated fences, retired erodible land to pasture for his high-producing herd, planted some parts to trees, and built a farm pond with his own equipment. He uses the pond for fishing and leaves the swimming to his nephew Snavely Garber, his nephew's wife, three grandnephews and grandnieces, and others of the younger set.

While Snavely's farm is marked by the more obvious conservation practices and his new white dairy barn, there's more to it than milk. Among the crops are corn, wheat, barley, hay, tomatoes, tobacco, peas, lima beans, and plenty of rotation pasture. Nephew Garber handles most of the actual farming now, while his wife takes care of the herd replacements and manages nearly 500 hens that produce at better than a 70-percent clip. But Harry Snavely himself was one of the first master farmers selected by the *Pennsylvania Farmer*.

A born public servant and organizer, Snavely has had many more pies than fingers to put in them. Besides buttonholing Lancaster County's traditionally cautious Pennsylvania Dutch farmers to tell them about conservation farming and what they can expect from it, he has served as county treasurer, director of the Pennsylvania State Farm Show Commission, president of the Lancaster County Sunday School Association, and

member of the Board of the Mennonite Home of Lancaster County.

Snavelly calls himself a lazy man and likens himself to the pious but willing soul who told the Lord that he would be willing to serve Him in any capacity, as long as it was advisory. Snavelly served as a State director of the Guernsey Breeders' Association. He promoted Hampshires for 20 years and shipped his breeders to many States and South America, besides serving as State secretary of the Hampshire Breeders' Association. He has also served as local representative, director, and executive board member for the Eastern States Farmers Exchange; and for 30 years has been a director of the Northern Mutual Fire Insurance Company.

Many of the labor-saving devices on the Snavelly farm have been built by Nephew Garber. They include everything from an automatic barn cleaner to a tomato picker. Among these devices, too, are automatic doors on the two bull pens, powered by

a discarded washing-machine motor. This saves anyone the necessity of getting too close to the animals. Not that he doesn't trust them, Snavelly explains, for he admits that he'll scratch their backs anytime—through the bars with a tobacco lath.

As side lines, the Snavelly farm boasts a fruit and nut orchard on whose trees Snavelly did the grafting. And just to make sure that there's sufficient force on hand to help nature with its pollination, for a little extra income and sweets on the table, he keeps 10 bee colonies.

"Snave," as he's known to his friends, admits that air-line hostesses are prettier than bus drivers, but claims that the planes themselves are no more comfortable than buses. He'll agree that they save a lot of time, but "Now that I've retired, time is all I've got." And he'll use it to spread the word on conservation farming.

—MATTHEW S. MIRANTZ.

MODERN LANDSCAPE.—Reared with an understanding and appreciation of the land, Coreen Mary Spellman, teacher of art at the Texas State College for Women at Denton, Tex., was merely putting on paper her mental

picture of a conservation farm when she painted "Contour Plowing."

Her water color was on exhibit at Will Rogers Memorial Coliseum during the 1950 Southwestern Exposition and Fat Stock Show in Fort Worth. It attracted the attention of thousands of show visitors.



Coreen Mary Spellman.



"Contour Plowing."



This bridge was washed out by the May 10-11 storm.

RECORD STORM PROVES VALUE OF *Control Measures on Farms*

By LOUIS P. MERRILL

THE RAINS that fell on May 10 and 11 in south-central Oklahoma were the kind that are likely to occur only once in 50 years. In fact, the old-timers recall that the only comparable rainstorm fell back in 1908, 42 years ago.

The water this time came in heavy, sluicing downpours that pounded the land as if from jets. At Wayne, in the Washita River watershed, 4 inches fell in 40 minutes. At Purcell nearby, 15.5 inches fell in 30 hours, 13.6 inches of it in 24 hours. Perhaps the most damaging flood on record occurred along the main stem of the Washita from Lindsay to Davis.

The runoff waters gathered in stream channels, tore across lowlands, and ripped out levees, roadways, and bridges. In the towns of Duncan, Pauls Valley, Comanche, Waurika, and Maysville 1,250 people were made temporarily homeless. Twenty-four homes were destroyed and 67 incurred major damage.

Altogether, in dollars, the damage on the Washita and Red River watersheds was estimated at \$17,784,000. This included the loss of 29,500,000 tons of topsoil at a nominal value of 25 cents a ton. Crop losses accounted for \$2,537,500 of the total, and damage to roads and bridges came to \$2,478,000 more. Other items included damage to homes and other property in cities, farm homes and equipment, stored crops, livestock, fences, ponds, terraces, and levees.

Two lives were lost.

In Owl Creek watershed near the town of Wayne, Rual Leveridge looked about after the rain had stopped on May 11 for a way to tell how much rain had fallen. An oil can near the house had been empty before the rain. Leveridge measured the depth of the water with his hand. The level was well up on his wrist. Eleven inches, he fig-

ured, in a can narrowed somewhat at the top.

In the neighboring watershed of Finn Creek, Walter Gray tried to keep up with the little rain gage out near the barn. The gage held 5 inches. Twice when Gray emptied it, the gage was running over. Then it filled to the 2-inch level by the afternoon of May 11.

In Owl Creek, a tributary stream of the Washita River, the Soil Conservation Service had planned and carried to partial completion the kind of agricultural flood-control program which Congress in 1944 authorized for the Washita.

Within the preceding year four detention reservoirs had been built in that watershed. Others had been planned, but no construction done.

However, the effect of the four dams in protecting cropland, stock, fences, and other property in bottom lands below was convincing.

One of the reservoirs was on Leveridge's farm, another on the nearby farm of R. H. Atkins.



When Finn Creek went out of its banks on May 10-11, it left sediment 1 to 12 inches deep over 100 acres of bottom land.

NOTE.—The author is regional director, Soil Conservation Service, Fort Worth, Tex.



Site No. 1 detention reservoir, empty before storm, reached peak flow on May 18, when this picture was made. Water filled permanent pool and rose 30 inches above lip of draw-down pipe. But for this reservoir, land below would have flooded.



Leroy Burnett did not, as in previous years, have to replace this water-gap fence after the spring floods.



Burnett's 12-acre field of growing corn was safeguarded; it lies immediately below detention reservoir No. 5. Before this protection he lost crops 7 years straight as result of floods.

Reservoir No. 1, on the Atkins place, has a drainage area above it of 500 acres. Its surface area at spillway level is 33.8 acres. The smaller reservoir, No. 2, receives water from a drainage area of 200 acres, and its water area at spillway level is 13.2 acres.

Leveridge has 30 acres of good bottom land on Owl Creek below the two reservoirs. It is his most productive land. He started farming it 20 years ago, and for the first few years the yields in corn and other crops were good. In later years, however, when rains were more frequent and heavier, the stands were not so good. Flooding damaged the crops and Johnsongrass moved in.

Leveridge had not regarded the protection of the dams as being too reliable. Years ago he tried straightening the creek channel to speed the flow of runoff water. That helped some, but he continued to lose crops from overflow year after year. However, in the May 10 and 11 rains, the water behind the dams barely reached spillway level. The creek stayed in its banks. And, after seeing the results of the protection given by the dams under such intense rainfall, Leveridge became enthusiastic about his 30 acres of bottom land. He means to do some leveling and filling, and there are some trees that ought to come out to make cultivation easier.

"There's quite a bit to be done," he said, "but this bottom land now has good possibilities. I'm going to improve it. It can grow good crops."

The fact that the water did not flow through the spillway of either dam is in itself significant. The reason lies in the thick stands of grass in the drainage area. The area is in good pasture grasses, mainly little bluestem. Rain falling on the grass moved slowly toward the reservoirs. Much of it soaked into the ground.

Below the Leveridge farm, Scott Brown, before the storm, had harvested alfalfa from eight bottom-land acres. His land showed no damage.

A mile and a quarter to the east is detention dam No. 4, on another small branch emptying into Owl Creek; and about the same distance to the southeast is No. 5, on still another small branch.

The drainage area for No. 4 is 300 acres, with 70 acres in cultivation, 220 acres in pasture, range, and woods, and 10 acres in abandoned cropland. The large acreage in cultivated land made the rate of runoff greater than for the drainage areas of dams 1 and 2. At one time during the runoff period, the water depth in the spillway was 1.8

feet, with 170 acre-feet of water behind the dam. This structure and dam No. 5 were completed late in 1949 and the sod covering was not well established.

SCS Engineer Harry Maricle of the Purcell Work Unit estimates that although this reservoir's spillway was in action only a few hours, its 18-inch draw-down tube discharged water for 90 hours. This meant that the capacity of the reservoir would have filled two and one-half times during the runoff period.

Immediately below dam No. 4 lives the family of R. L. Webster, across the road from the creek channel but nonetheless well down in the flood plain. The Webster barn is on the stream side of the road.

At the peak of the spillway discharge, the water came a foot up on the foundation of the Webster home. It ran into the barn 2 feet or so deep. The Websters were convinced that had it not been for the dam, the water would have been several feet deep in their home and that some calves would have been lost.

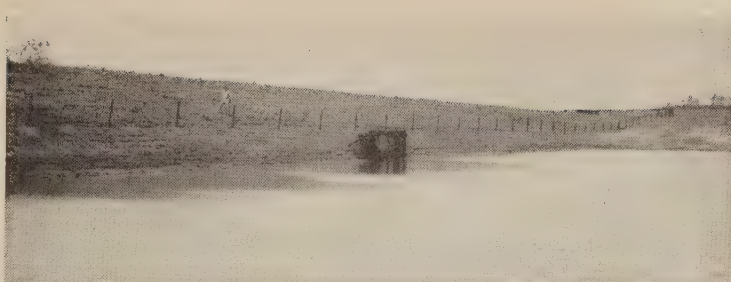
L. F. Powell and his brother Sam were cultivating 25 acres of corn on bottom land below the Webster place. L. F. said the rain and flooding were the worst he had seen in the 35 years he had lived there. However, he estimated the damage to his bottom-land corn stand at only about \$25 and gave credit to the dam. "If it hadn't been for that dam, the whole crop would have gone."

Early in the morning of May 11, Leroy (Buck) Burnett looked from his home up at the detention dam No. 5. He noted a bare section on the back side of the structure where the protecting Bermuda-grass sod, which was not firmly established, had given way.

He was concerned for a while—perhaps the dam wasn't going to stand the strain. But Dick Long, a neighbor who had seen such dams actually built, was reassuring.

"Every one of those dams will be there when most of the folks around here are gone," was Long's firmly expressed opinion. Long believes that the four dams saved Santa Fe railroad bridges farther downstream, near Paoli.

Burnett had been farming a 12-acre bottom-land field every year for 7 years. He had never made a crop because of the yearly floods. One year he got oats in shock—about 40-bushels-per-acre yield—but flooding cleaned it all out, taking the



Detention reservoir No. 5: Harry Maricle, SCS engineer, indicates high watermark after May 10–11 downpour.



Break in levee along State Highway 24, 8 miles west of Wayne.



Detention reservoir No. 4: Dick Long, farmer, points to high water level reached during downpour of May 10 and 11, when 15 inches fell in 30 hours; 18-inch draw-down pipe ran 90 hours, water ran brief period over spillway, reservoir filled two and one-half times in 72-hour stretch.



Mrs. R. L. Webster, who lives below detention reservoir No. 4, shows top level of water on morning of May 11. It would have risen 2 feet inside this home, say the Websters, had it not been for the dam.

fences along. The loss ran to more than \$500.

Year before last, following a heavy rain, Burnett swam a horse in that same bottom land. This year, in spite of the fact that the rainfall was three times as great, there was no flooding of the field. The stand of corn was undamaged, and Burnett was sure he was going to make a crop at last. Also, for the first year since he came to the place he did not have to replace the water gap where his fence crosses the creek.

Burnett was another farmer who, before the dams were built, was not certain they would be of great value. Now he says: "If they'll build enough of them, they'll do a whole lot to help stop this flooding."

Further downstream, after several small branches and the larger East Owl Creek had begun emptying their floodwaters into the main Owl Creek stem, the benefits of the flood-control works were not in evidence. Earl Carder, on Owl Creek southwest of Paoli, for example, estimated his flood loss at \$600 in oats, broomcorn, and cotton.

"I'd sure like to see some more of that flood-control work around here," was Carder's comment.

L. P. Wigley, near Paoli, reported he lost 600 bales of hay and a half mile of fence.

On the eastern limits of Paoli, Mrs. J. L. Gooch could look far across the creek valley. The floodwaters May 11 were more than a quarter mile wide across the sweep of bottom land. They covered the highway going east. They slipped across the Santa Fe tracks near the Gooch home and lapped into the chicken yard. Mrs. Gooch could see that the Hatch residence across the creek had nearly 2 feet of water in it.

Nearby Finn Creek long has been a troublemaker for bottom-land farmers. Its appearance after May 10 and 11 was in marked contrast to the Owl Creek area which the flood-control work had protected.

Less than a mile separates the boundaries of Owl and Finn Creek watersheds in places. The bottom-land fields in Finn Creek are some of the richest farm lands in Oklahoma. For example, a little over 21 acres of bottom land farmed by L. J. Key produced more than 34 bales of cotton in 1949. Key's 1950 planting of cotton in the field was covered by sediment, and on 100 acres of his land he found the sediment from 1 to 12 inches in depth. Two weeks after the rain, Key was harrowing to dry out his land for another cotton planting.

Walter Gray, one of the biggest landowners in Finn Creek, was not discouraged by the work of the floodwaters that came across his bottom lands, but it was quite a jolt, he admitted. In 20 years Gray had spent \$35,000 on levees and channel straightening to keep the waters off his land. After the May 10 and 11 rains, when the Finn Creek waters reached nearly to his house, there was probably more footage in breaks in his levee system than there was in levee that was left.

The flooding damaged 100 acres of his land, washing out his stands of corn and cotton, or scouring and washing the land away. On the Self estate across the road from him, the picture was the same—washed-out or buried crops.

"I guess I'll try to fix the levees again," Gray said. But he expressed great interest in a program of agricultural flood control.

"Stopping a flood before it gets started seems to me to be a sensible way to do the job I've been trying to do here so long."

200 STUDY SOIL AT NINTH ANNUAL INSTITUTE

By WELLINGTON BRINK

TO the metropolitan crossroads of America came this year from its proving grounds in Ohio the now-celebrated Annual Institute of Conservation, Nutrition, and Health. To Chicago, famed market place for grain and meat and farm implements, came the men and women of the soil on which the city grows and thrives. Here gathered in July 200 and more Friends of the Land to consider the substance which is the chief source of all life, the soil.

The institute now is nationally important. It deals each year with some transcendent theme. Last year the theme was water, this year soil. And always, above every field of inquiry, hovers the question of human health and advancement and final destiny.

We owe much to Friends of the Land for marshaling for these events the newest findings of laboratory and experiment station, the freshest

approach, the boldest and bravest ideas; for bringing together a panel of distinguished speakers, and a membership of men and women capable of threshing out the good kernel and carrying it away for planting in their home communities.

In the pattern that was so outstandingly successful at Tar Hollow, Coshocton, and Athens, Ohio, the Ninth Annual Institute achieved another triumph in two memorable days at Chicago, July 6 and 7. It opened with a statement of purpose by Ollie E. Fink and closed with a summary by Jonathan Forman, the educator-doctor team whose genius originated the conference and has guided its destinies through nearly a decade. For the first time, it included a dinner, attended to capacity, which presented the geographer-explorer Dr. Earl P. Hanson, of the University of Delaware, and the famed author-Malabarfarmer Louis Bromfield. Hanson berated the pessimists and pointed to the agricultural-industrial opportunities in various remote parts of the world. Bromfield, always informative and inspiring, told his famous chicken-litter story which is one of the many good yarns in "Out of the Earth" (see September's SOIL CONSERVATION Magazine).

The institute dealt with the first fundamental, Soil: The Cradle of Life. It explored soil's physical structure and chemistry and microbiology, delved into uses and economics, deliberated on nutrients and their effects on plants, livestock, and people. It wove a texture of understanding, a concept, calculated to lift soil out of the realm of the abundant commonplace to that of an exciting, beckoning frontier for further exploration. The institute found in Chicago not only the roar of factories and the tensions of business but also unsurpassed facilities for communication and transportation; it was at home where universities and research centers are at home, where dwell so many Pulitzer and Nobel prize winners and other men and women of the learned professions—and for the same reasons.

Out of the institutes have come the extra dividends of books of enduring character. *Water and Man: A Study in Ecology* (Friends of the Land, \$4.50) is the most recent—a significant volume by Forman and Fink which pulls together the proceedings of last year's institute and includes a few additional chapters for good measure.

Paul Sears observes in his foreword to this book: "No phase of our environment registers

disruption more sensitively than the water cycle. No phase affects human welfare more directly and profoundly. Across the land from Los Angeles to Manhattan, on farms and in villages as well as in great metropolitan centers, there is insistent concern over the growing thirst of our civilization, the thirsts of men and beasts, of field and foundry. . . . Those two notable impresarios, Messrs. Forman and Fink, have done some amazing things in the cause of conservation. But I seriously doubt if anything they have done will outweigh in value and importance the book which follows this brief note."

Here may be found some of the answers to water shortages. Here are compared the work of the valley authorities and the accomplishments of the Brandywine Valley Association and the Muskingum Watershed Conservancy District. Here set forth is the menace of water-borne diseases through stream pollution. Nowhere else that I know is there such a useful one-volume compendium of water information available to the expert or the layman. "Water and Man" is a working tool for the conscientious public servant, for the public-spirited private citizen, for the conservation student.

The institute and its books are among the many evidences that Friends of the Land has come of age. Its lusty membership of 10,000 is by no means a measure of its strength and influence. Friends of the Land is a fraternity of community leaders, drawn from all parts of the Nation, representative of a variety of professions and businesses. It has a wide wingspread, speaks with freedom and intelligence, directs a vast auxiliary following. It includes writers, orators, actors, painters, lawyers, bankers, merchants, railroad executives, farmers, scientists, gardeners, housewives. It speaks brilliantly and well through its unique quarterly magazine, *The Land*, edited by the equally unique Russell Lord, who is accorded support in the art department by his talented wife Kate. It chats briskly of issues and activities in *The Land News*, whose editor is the colorful and versatile Jonathan Forman.

Chapters mushroom, membership expands, as the good works of Friends of the Land become known. Once again is demonstrated the eagerness of Americans to flock to an organization that is fighting the people's own fight.

QUOTES FROM THE CHICAGO MEETING

EARL PARKER HANSON, chairman, department of geography, University of Delaware: The concept of overpopulation is utterly meaningless except in terms of poverty, ignorance, hunger, and ill health. It is never a land that is overpopulated in terms of inhabitants per square mile; it is always an economy, in terms of inhabitants per square meal. The land cannot be stretched, but the land's productivity, meaning the economy, can be stretched and is being stretched everywhere. And the conservation of the soil must be, and is coming to be, regarded as a function of that stretching.

The day of specialized, departmentalized, one-sided thinking is now all but over. The men, for instance, who plan Puerto Rico's current astonishing progress through production, cannot specialize in agriculture, or manufacturing, or legislation to bring about social reform. They cannot draw boundaries between those activities, but must think of the island and its people as one whole.

As a world movement, the point-4 idea today marches on inexorably for the simple reason that it is demanded by somewhere between 1 and 2 billion human beings who are tired of being regarded as mere cheap labor. The restlessness and the growing determination of those hundreds of millions constitute a force, a power, a weapon if you wish, far stronger than those of all the atomic bombs we can manufacture. And the survival of our civilization and culture that the Jeremiahs talk about can be attained only through going along with that restlessness. Survival today is possible only through rapid progress. And progress of the world, of our world, is possible only through rapidly accelerated production everywhere.

DR. GEORGE K. DAVIS, animal nutritionist, Florida Agricultural Experiment Station: With wild animals, the unrestricted range protects from intense deficiency. In cattle, goats, and sheep, which are limited in their range to deficient areas, the animals suffer in spite of apparent adequacy of feed, unless supplements are provided. Experimental work has shown the relationship of phosphorus to animal health. In Minnesota, cattle on a deficient ration consumed as much as one and one-quarter times the feed necessary for maintenance, but lost weight. Supplied with a phosphorus supplement, the animals made good use of their feed and gained rapidly in weight and condition.

Calcium is so closely tied to phosphorus in nutrition that it is almost impossible to consider the one without the other. Ninety-nine percent of body calcium is in the bones, but the remaining one percent is essential for many body functions ranging from muscle activity to energy metabolism. Calcium is necessary for milk production,

and a deficiency will result in lowered milk yield, starvation of the young, and a weakened condition of the female, as well as reduced returns to the farmer.

When insufficient copper is present, the general poor condition seems to be associated primarily with the anemia which develops under these circumstances.

Another element which has caused spectacular effects is cobalt. The amount of cobalt required by a ruminant animal is small compared to the other nutrients. Less than 0.1 part per million of cobalt in the feed, or 1 milligram a day, will take care of the needs of a 1,000-pound cow. A cobalt deficiency in feeds causes a decrease in appetite, and looks like starvation. With depressed appetite, the animal will often not eat sufficient feed for maintenance.

With anemia there is always the possibility of a need for iron. The amount of iron required by an adult animal is quite small due to the ability of the animal to retain iron and reuse it. When young animals are in an area low in iron, they respond rapidly to iron supplements because of their need for iron in blood formation.

Blood loss due to parasite injury or insect damage or to any blood loss may result in a need for iron that can be supplied by iron supplements. The anemia of iron deficiency is somewhat different from that seen with copper deficiency and cobalt deficiency. It occurs in some areas where insect injury is at a maximum. If the insects cannot be controlled, it pays to feed to these animals iron supplements.

Some observers have offered this as the reason for deer licking iron outcroppings during the summer and fall periods after a season of heavy insect attack. Deer subjected to insect attacks over a period of several months lose relatively large amounts of blood and might have need of a definite supplement of the mineral elements such as iron.

Continuing investigation and research of animal needs in terms of forage nutrient content and this related to the soil nutrients is the price of continued animal health. With increasing production of feed, and more rapid development of animals, the need for increasing knowledge of the nutritional requirements is intensified. As a popular song once put it, "It's the little things in life that count." Trace elements are important in animal health.

DR. ELIZABETH McCOY, professor of agricultural bacteriology, University of Wisconsin: Without its micro-organic life, soil would not be the dynamic, perpetual system that sustains all plants and in consequence all animals. The basic mineral structure of the soil, though important chemically and physically, is merely the habitat of the life of the soil. And of that life, the bacteria and their near relatives among the fungi are unquestionably the key to the biologic balance in the soil. It is trite but true that the cycle of elements would run down, if it were not for the microorganisms. They are the agents of decomposition of the organic matter tied up in plant or animal bodies. For their own purposes, the microorganisms take a small share of the necessary elements for growth of their own cells, but infinitely more important, they release for plants the major share of

those elements from bound form in complex organic matter.

Working upon the organic wastes excreted or upon the dead bodies of plants and animals, they hydrolyze and ferment and oxidize to obtain energy for their life processes. By working in relays, one type carrying on the decomposition when another leaves off, they eventually carry the decomposition to completion; i. e., they return the carbon to carbon dioxide, the nitrogen to ammonia and so to nitrate, the sulfur to sulfate, the phosphorus to phosphate, etc. These are the nutrients for plants and they, in turn, are nutrients for animals. Thus, the soil, because of the life within it, becomes a great digestive system, and the cycle of elements is perpetual.

What comprises the microorganic life of the soil? It is conveniently described as microflora and microfauna, and consists of the following groups:

	Average weight in pounds per acre-foot of soil
Bacteria	500-1,000
Fungi (molds, etc.)	1,500-2,000
Actinomycetes	800-1,500
Protozoa	200- 400
Algae	200- 300
Nematodes	25- 50
Other worms and insects	800-1,000

Taken together, they amount to 3-5 tons per acre-foot of soil, which is a very considerable crop, comparable to plant or animal crops. Such figures are of interest but they still do not tell the story of relative importance. Average populations in a fertile soil are more indicative:

	Average numbers per gram of soil
Bacteria	1,000,000,000
Actinomycetes	10-20,000,000
Fungi	1,000,000
Protozoa	1,000,000
Algae	100,000
Nematodes	10-50

Most of these microorganisms are found near the surface of the soil, usually within the upper 6 to 12 inches, and this stratification is a direct example of the ecological relations within the soil. Proper moisture, temperature, and aeration, as well as the greater concentration of organic matter as food, favor the microorganic population in the surface zone. Within the zone there may still be localization of types in a micro-ecological sense; in fact, there are many examples of particular populations of cellulose fermenters, pectin fermenters, urea fermenters, putrefactive bacteria, etc. springing up in conspicuous numbers in response to their specific food in the form of plant or animal residues.

Consequently, whenever barnyard or green manure is plowed under on a field, there is an immediate surge of life. The easily decomposable organic matter, such as sugars, proteins, etc., are quickly attacked and decomposed. The more resistant organic matter such as cellulose, lignin, and waxes of plants and chitin of insect bodies and the like are slow to decompose. In fact at any one time, there is an accumulation of partially decomposed resistant organic matter, to which we give the name of humus. It is the mass of partially decomposed organic

residue of plant or animal or bacterial bodies, together with some compounds synthesized by the soil bacteria. It is not a stable compound or even mixture of compounds, because it is constantly undergoing slow further decomposition by soil microorganisms. Humus is dark brown in color and much of it is in colloidal state. There are several theories as to its biochemical formation. What may be called the humus-nucleus consists of ligno-proteinates combined with bases, with phosphates and silicates to form still other complexes. Thus, humus also serves an important role in the base exchange in the soil.

The amount of humus in soils varies widely. In water-logged soils, which are relatively anaerobic, humus accumulates to between 20 and 50 percent of the dry weight of the soil. Such soils are low in fertility because their plant food is tied up in the organic form, waiting upon hydrolysis and oxidation to make it available. In loose-textured sandy soils the organic matter is rapidly and completely oxidized so that little humus accumulates. The ideal situation is the intermediate where there is a reserve of humus, in the range of 5 percent, with conditions allowing the bacteria to convert it to plant food as needed. Thus, humus is a key "compound" in soil, and proper soil management has as one of its chief objectives to encourage bacterial formation of humus.

DR. GEORGE D. SCARSETH, director of research, American Farm Research Foundation: In general, soil tests help to estimate the *supply status*, tissue tests help to indicate the *first limiting nutritional factor*, and deficiency symptoms indicate *extreme and damaging shortages* in the plant. These are all practical diagnostic aids that no fertilizer research person or extension fruit, vegetable, or crops specialist, or properly trained person interested in better fertilization can afford to omit. Our agricultural colleges could render a valuable service by training students in these diagnostic procedures.

DR. EMIL TRUOG, chairman, department of soils, University of Wisconsin: The scientific study of the chemistry of soils started just about 150 years ago. In George Washington's time, very little was known of the chemistry of soils or the composition of crops, and hence, the nutrient elements which soils must supply to make satisfactory crop production possible. Nothing at all was known about soil acidity and the inoculation of legumes. That is probably the main reason why Washington found it difficult to grow clover, and failed utterly in his attempts to grow alfalfa. It is now known that the soil on his fields was strongly acid. Because much, if not most, of Washington's time in his later years was devoted to problems of soil management and crop production, one can well imagine that satisfaction which he would have derived had it been possible for him to participate in an institute of the kind being held here today.

In considering the composition of soils in relation to the plant nutrient elements derived from the soil, it is well to recognize that these particular elements make up only

5 to 10 percent of the weight of soils. Is the other 90 to 95 percent of soils mere filler or ballast? No. It provides the framework of soils which is just as necessary in the make-up of a medium for plant growth as the nutrient elements themselves. Three elements—oxygen, silicon, and aluminum—usually make up most of this framework. They exist in combination with each other, in the form of resistant minerals called silicates. They make up both the coarser (sand) and finer (clay) fractions of soils. The nutrient elements in various combinations exist intermingled or dispersed within this framework in rather fine subdivision for the most part.

Soils contain varying amounts of organic matter, ranging usually from 2 to 3 percent up to 6 to 7 percent. This organic matter, like the mineral matter, is made up largely of non-nutrient elements. It contributes to both the framework of soils and the store of nutrient elements, and serves as the main food supply of soil bacteria which give life to a soil.

Perhaps the most important chemical property of a soil as regards its fertility is its reaction or pH. The main reason for this is that the pH of a soil profoundly influences the availability of all of the nutrient elements. In the humid region, soils tend to become acid because of the loss of bases by leaching. Fortunately, this loss can be made up through the addition of lime and fertilizers. Results of numerous experiments show that a pH of 6.5 (just very slight acidity) is a favorable reaction as regards availability of plant nutrients, activity of soil bacteria, and other desirable conditions which promote soil productivity.

In the treatment and management of soils we are often concerned largely with the supply and availability of the nutrient elements. Fortunately, both the supply and availability can be made more favorable through feasible practices of soil management, including additions of lime and fertilizer.

In connection with the addition of lime and fertilizer to soils to make them efficient producers, it may well be asked just what happens to these additions? Is there not great danger of loss of fertilizer elements by leaching? Or does not the soil fix them so that they are no longer available for crop use? It is an apt simile to say that a good soil husband a heavy dose of fertilizer, just as a frugal person would husband a legacy of say 1 million dollars in cash.

DR. ROGER H. BRAY, professor of soil fertility, University of Illinois: I am going to tell about my new concept of elastic fertility—why yields of crops can vary tremendously without varying the fertility requirements for phosphate and potash and all the rest of the nutrients except nitrogen, and why nitrogen is an exception to this law. Elastic fertility adapts itself to any sized yield at one end of the elasticity scale (K, P) and fertility which is good enough for only one-sized yield at the other end of the elasticity scale.

I want to tell how this elasticity concept explains many phenomena heretofore not explained by former soil-fertility concepts. It explains why most nutrients work on a percentage basis and at least one, N, works on an abso-

lute basis. It tells why you have to have, in many cases, just as much fertility in the soil for low productivity as for high productivity if you want crops of the proper composition. It shows how to control fertility by determining the proper soil levels and maintaining them at the proper levels by soil testing. It tells why the soil type is no longer considered a fertility unit and why we can use the same recommendations on a wide variety of soil types. It explains why we do not have to worry about the law of diminishing returns in fertilizer use—a false philosophy which has held back soil-fertility build-up for the last 100 years.

DR. JOHN F. TIMMONS, professor of land economics, Iowa State College, Ames, Iowa: Ever since man was evicted from the Garden of Eden, he has been much concerned with utilization of land resources as the basis for his survival and for the improvement of his level of living. Only very recently has man in this and a few other nations fallen into the dilemma of producing more from land resources than he can get distributed and consumed. Apparently, the pressure of food supply upon population is beginning to replace the pressure of population upon the supply of food in this small sector of the world.

Examination of current land programs and policies in this country reveals some basic confusions and conflicts that warrant serious consideration by all citizens.

Objectives of land utilization start and end with man. Land is important only to the extent and manner in which it contributes to peoples' wants. Since land is not productive until used with capital, labor, and management, the objective of land utilization is one of getting the most of the things people want out of the land in return for the least amounts of labor, capital, management and land used in the process. The objective is truly one of economizing our total resources, including labor, capital, and management, as well as land.

Since the purpose of land utilization is to provide people with the things they want which can be obtained from land, attention should be given to the wants of people. In an effort to get those things produced at least cost which people want most, increased attention must be given to population composition and distribution and to the changing preferences of consumers.

In satisfying today's wants, care must be taken that land resources are not used up, but instead, maintained in order that tomorrow's citizens will continue to satisfy their wants. This problem of balancing satisfaction of present and future wants is the heart of the soil conservation problem. Its solution begins with an approximation of what the future wants may be. This involves consideration of population growth, living levels, foreign trade, and technological improvements.

Although most of the agricultural land of the Nation is in private ownership, public interest forbids individuals to exploit their land to the detriment of future generations. Land resources are not the absolute property of any particular generation or individuals. Public welfare demands that the land be used in such manner that the benefits from land will be maximized over many generations.

Apart from the several agencies now concerned with land use, there is a real need for a continuing national agency not involved in the administration of any particular land program, to integrate, study, plan, evaluate, and recommend programs and policies concerned with the utilization of the Nation's land resources.

DR. K. STARR CHESTER, supervisor, Agricultural Division, Battelle Memorial Institute: Completely nutritive foods can be produced only on soils that contain adequate amounts of all the minerals that are required for normal plant and animal development. Many of our soils are deficient in some of these minerals, which must be restored if the soils are to be the cradle of a healthy society based on a healthy agriculture.

Restoration of lacking minerals in our soils in a rational manner calls for means, such as do not now exist, for completely analyzing soils and agricultural products for all the essential minerals. This need can be met most economically and effectively by the establishment of a central, national analytical facility.

Here the best of modern analytical methods can be combined with the economy, uniformity, and reliability of modern production-line processing, so as to furnish, at low cost, the hundreds of thousands of complete mineral analyses that are needed. The laboratory would not make recommendations on soil improvement, but, like the clinical laboratory behind the family doctor, it would enable farmers to receive better counsel on restoring soil fertility from their local agricultural advisers.

So that this service can at all times be guided by the best of modern technical understanding, it should be under the advisement of a council of leading authorities in soil science and nutrition.

The initial installation will be costly, but the volume of analyses, which is assured, should soon place it on a self-sustaining basis. Considering the significance of this service to agriculture, conservation, and human health, and its scientific soundness, it is believed that the cost of establishing it will be forthcoming.

DR. HELMUT KOHNKE, department of agronomy, Purdue University: Soil is made up of three main components, the solid particles and the liquids and gases in the pores. Each of these parts is essential for plant growth. The condition of the water and the air in the soil depends on the size, the composition, and the arrangement of the solid particles, but also on the climatic conditions and the activities of man. It is the task of the soil physicist to study and organize these facts and to recommend the type of management that will result in the greatest sustained crop growth.

DEATH ON SILT-COVERED HIGHWAY.—Last June the *Osceola* (Iowa) *Tribune* carried the following story:

"Mrs. Leon Solakian of New Haven, Conn., was killed when the car in which she was traveling skidded on silt washed on the highway 6½ miles east of here. The car plunged down a 12-foot embankment. Four other occupants of the auto were not injured."

BUSINESS AND FARMING JOIN HANDS

By CAL L. ROARK

BIG BUSINESS can be a good landlord. Recently I visited R. E. Rhyne, the land agent who looks after about 14,000 acres belonging to the Duke Power Co. west of the Catawba River in North Carolina. This and other property in the Carolinas was bought primarily for reservoir sites. District Conservationist J. D. Miller and SCS Technicians E. F. Burgess and Clarence Hood, who help farmers on this land with soil conservation, have found good land use the first rule with Rhyne and the farmers working on company farms.

Two things impressed me: First, the evidences of down-to-earth, practical, business farming and forestry management on company lands. No fancy farming or show-off stuff goes—just good practices equal to those carried on by others in the community. Second, the democratic procedures that are followed in company relations with the farm families tending Duke land and with others in the area. These farms and families are simply parts of the communities, no better and no different from the others who are participating in local agricultural programs.

Take for example Duke's participation in the work carried on in soil conservation districts. These families engage in both educational and actual on-the-land activities in about the same proportion and with about the same results as do others in their communities.

Rhyne is a quiet, mild-mannered man in his early fifties. He told me that all of the economical farm units are farmed by families on a share basis. Duke handles directly, however, all of the woodlands, reforesting land best suited to that use, and practicing scientific, practical forestry management on existing woodlands. Forestry and other land-management work on the Duke system of farms is under the direction of C. J. Blade of Charlotte, N. C.

NOTE.—The author is in the information and education division, Soil Conservation Service, Spartanburg, S. C.



Dense sod now blankets once-idle land. The spring filled the pond. Land Agent Rhyne stocked the pond with bluegill and bass and fertilized the water. Now the Catawba County farm is being stocked with registered Herefords to harvest grass and turn it into cash.

In Rhyne's area about 300 acres have been set to trees in the last 2 years. The company uses a tree-planting machine to speed up this phase of conservation. And when crews are setting trees, thinning pines, or making selective cuttings on company lands, these operations are often used as demonstrations for the farmers nearby. This has helped a lot in getting others to adopt good forestry practices.

Blade said that the company has planted pines on 8,000 acres of badly eroded farm land, most of it in South Carolina. He noted: "Due to this reforestation and the work of the SCS on adjoining farms throughout the whole Catawba River watershed, our lakes are continually becoming clearer."

Rhyne and other Duke officials encourage participation in soil and water conservation. To this end, Duke maintains a few demonstration farms as "proving grounds" for practical and profitable soil and water conservation practices. The 320-acre farm in Catawba County where Rhyne lives is one of these demonstration farms. Another is the W. K. Stutts farm at the Catawba-Iredell County line on Highway 150 near Sherrill's Ford.

The Stutts farm is used as a meeting place for Duke farm families and their guests. The roomy farm home sits in a beautiful grove of large oak trees surrounded by alfalfa. It is here that about 600 Duke families from the Carolinas gathered at the last meeting along with invited guests. Barbecue, drinks, basket lunches, square dances, baseball games, and horseshoe pitching were enjoyed.

At each meeting on the Stutts farm there is always a distinguished speaker. Senator Clyde R. Hoey, Dr. H. H. Bennett, and Senator Cameron Morrison have made addresses here.

The farm Rhyne lives on and manages gradually is being stocked with a herd of registered polled Herefords. Although most Duke farmers do not have commercial herds, Rhyne figures that they will later want to add a few good beef cattle from the registered herd on this farm.

On Rhyne's proving grounds are several practices expected to spread over the entire farm system. An example is strip cropping. This farm was terraced, but some of the terraces broke and did not control runoff until strips were added. Since then, the terraces have worked well and the soil has stayed in place.

Part of the farm along the road displays a 25-acre field of Ladino clover-orchardgrass pasture with a modern farm fish pond in it. People know that this land was formerly idle but now is one of the best spots on the farm. Wildlife border strips and bird food patches are also included.

Many Duke farmers have undertaken complete soil and water conservation plans. All of them, both colored and white, are doing limited conservation work. Rhyne told me: "When I think a man has advanced enough to start a complete program, I suggest that we get the SCS technician to help us fix up a plan for the farm. Every now and then, the farmer will confess that he already had decided it was a good thing.

"That's what we try to get every man around

to, but we're satisfied if they advance as fast as others in the community."

E. F. Burgess explained that Rhyne's method of encouraging cooperation in soil conservation suited Catawba district supervisors. "We're mighty glad that when these farmers ask us to help them, they're really prepared to start carrying out a well-balanced conservation plan."

Duke provides other inducements to their farm families to do conservation work. Company-owned bulldozer, terracer, and crawler tractor are used to smooth over gullies, build terraces, make ponds, and do other earth-moving jobs. The company also furnishes some seed, lime, and other materials to get each farmer started.

"We bear the expense of doing the conservation work which does not provide immediate benefits to the farmer such as the more permanent practices of terracing, tree planting, fencing, permanent pastures, and so on," the land agent explained. "And of course where that is done we get such benefit payments as are earned under the PMA program."

Some of the many soil and water conservation practices which Duke farmers are applying in addition to terracing, tree planting, and ponds, include strip-crop rotations, fertilizing and liming, alfalfa and pasture establishment.

There's very little moving away from Duke farms, according to Rhyne. Most farmers stay year after year. "Why, O. L. Beatty's been on one farm 2 miles south of Terrell since the middle 1920's. Last year he made as much as 100 bushels of corn to the acre. He was in the top five of the county in corn yield. His son, a 4-H Club boy, made a still larger yield—had the highest 4-H Club corn yield in the county."

I queried Rhyne about what seemed to him to be the main reason why Duke farmers took hold of soil conservation work so well. "When they realize that applying a conservation practice will make them more money or make the farm more attractive and livable, they're ready for it," was his reply. "There's a fine spirit of competition among these fellows, too. When one does something that works out well, others take it up."

Incidentally, Rhyne's son Rufus is an assistant county agent in Stokes County.

COLLEGE ANNUAL.—Soil conservation occupies eight pages in the Cherokee Phoenix, 1950 annual of Reinhardt College at Waleska, Ga.

AROOSTOOK'S CHANGING AGRICULTURE

By HENRY E. LIBBY

AROOSTOOK County, Maine, is beginning to get diversified farming.

Earlier it had a beginning in diversification, but it lacked processing plants and wholesale outlets for beef, dairy products, and various crops. The first important step was taken when a freezing plant was established in Houlton, with viners located in various areas and an extensive contracting of pea acreage.

The next forward move came when a milk-receiving plant was built in Island Falls. It has done a lot to promote soil and water conservation through pasture improvement, better seeding mixtures, and increased grassland farming.

Aroostook produced the all-New England winner in the Green Pasture Contest—Beverly Rand. His farm is in the town of Sherman, and it is a good example of Aroostook's new agriculture. After Rand was graduated in agriculture from the State University he returned to the farm to put his knowledge to practical application.

His lush Ladino, timothy, and brome pastures have been seen by many, but he is not a grassland farmer. With the help of Soil Conservation Service technicians, he is hunting methods of diversification which will enable him to rotate part of his land in three cash crops. Peas are harvested and shelled on the farm. The viner deposits the vines in a 200-ton trench silo, attached and based on a level with the dairy.

There also is an upright 50-ton silo for grass silage. Home-grown grains are ground and mixed—8 pounds of barley, 8 pounds of oats, and 4 pounds of a 32-percent supplement—as feed concentrate. The Ladino and timothy rotation is used as pasture and hay and gives a good legume cover to plow under for potatoes.

This farm had only one field in permanent grass during 1949. There was an excellent stand of Ladino and smooth brome. Rand also started to renovate an old 25-acre pasture, bring it into produc-

NOTE.—The author is district conservationist, Soil Conservation Service, Island Falls, Maine.

tion and put it to the credit side of the farm ledger. Being knolly and covered with scatterings of cedar, fir, and raspberry bushes, it had not been contributing to the farm income.

The Southern Aroostook Soil Conservation District, with which Rand has been cooperating since 1942, helped him locate a contractor to pull out the trees. Then, working with a crawler tractor and bog harrow, the contractor put the area in shape for liming, fertilizing, and seeding to a permanent pasture mixture. This work included construction of a water hole for stock water.

The New England Green Pasture Contest winner is not content to sit on his laurels. He is striving to improve his pasture and farm set-up. Of 435 acres, approximately 200 are under cultivation and 25 are in improved pasture. The remainder is old wooded pasture and woodland.

This year the farm enterprise consists of 68 acres of potatoes, 55 acres of peas, 24 acres of barley, 53 acres of rotation hay and pasture, and 25 acres of permanent pasture. The farm supports 70 head of registered Holsteins—28 milkers, 2 bulls and 40 head of young stock. He keeps about 1,000 laying hens in a remodeled barn.

All this brings a cash income to help defray stabilized costs. It eases farm labor and blends into a more permanent agriculture.

PROGRESS IN SOIL CONSERVATION

(Continued from page 54)

completely and finally decided in any such manner. In large degree, it will be resolved at the corner grocery store, on Saturdays by farmers who go to town, on Sundays after church services, and in scores of other country places where farmers ask other farmers the pertinent question: "How much did your soil conservation work increase your per-acre yields; how much did it increase your net income? Did some of your increased income go to the Nation's treasury as income taxes?"

And business and professional men and women, and city people, too, will inquire about the welfare of the land.

The answers are going to be on the positive side of the ledger, both for the individual and the people as a whole.

These are deeply rooted views; they stem from my 47 years of work on the land. I feel good about the results. I sincerely believe that any turning back now would mark the beginning of grief for the Nation.

REVIEWS

THE ESTABLISHMENT OF VEGETATION ON INDUSTRIAL WASTELAND. By R. O. Whyte and J. W. B. Sisam. Commonwealth Bureau of Pastures and Field Crops and the Commonwealth Forestry Bureau. Aberystwyth, Wales, Great Britain, 1949. 78 pages. Illustrated. \$1.40.

The authors of this volume are of that group of Britons, the Aberystwyth clan, known as masters of the art of compilation in the field of agricultural science. They seldom theorize in their publications, but they do present the problem faithfully and give you the known facts and accomplishments regarding the solution on a world-wide basis. In this book they deal with methods which have been used successfully to reclaim land devastated by the dumping of deep-mining wastes, strip mining, and the piling on the land of unused and mostly unusable materials by steel, brick, pottery, glass, chemical, and other manufactures, as well as a host of lesser industries essential to our present-day economics and living. There are about 60 photographic illustrations, revealing to the eye both the difficulties and the remarkable results where science and persistence work hand in hand to establish profitable woodlands and even good forage crops on industrial wasteland.

The information given on revegetation methods used on such areas in England, Scotland and Wales, the United States, Germany, France, South Africa, and the island of Cyprus, was gathered meticulously from the existing scanty bibliography on the subject, and to a large extent by correspondence and personal observation. After discussing the extent of the problem in these countries, the authors give us chapters on types of industrial wastelands, treatment before planting is begun, and then a detailed treatise on the best-known ways of establishing trees and shrubs, or pastures and other herbaceous cover, on these utterly ruined and scrambled lands. At the end of the book, S. H. Beaver's methods of surveying derelict land in the English Midland countries is outlined, for those who may wish to use it, or as an aid in developing other survey methods to fit conditions wholly or partially different.

Apparently the book went to the printers just before the British Government's order restricting the surface working of coal and requiring land-restoration contracts before mining is begun, went into effect. There is no mention of the land-conservation regulation now in force in England whereby the topsoil must be removed and piled, and then the subsoil piled separately for returning to the land after mining is finished. See Grover Brown's "Strip Mining and Land Restoration" in the December 1949 issue of *SOIL CONSERVATION*. And, if interested in similar methods recently used in Harrison County, Ohio, see the *Ohio Farmer* for October 15, 1949.

From a practical viewpoint, the most valuable parts of the book are those which deal with the factors to be considered before treatment is applied to these waste areas,

and the chapter on establishment of vegetation by artificial means. Whether the area consists of old spoil mounds or of newly stripped or dumped materials, it is best to study it intensively, for revegetation is a tricky business and any one unfavorable factor may mean failure.

Can the surface be stabilized in the beginning to prevent erosion? Is a weathering and settling period necessary? Are there any plant nutrients in the material on top of the area? Is it acid or toxic? Are there escaping gases? Is leveling possible or would it help any? If nitrogen is lacking, are there any nitrogen-fixing plants that will grow in the climatic and "soil" conditions? Are soil-moisture and drainage conditions in the seedling root zone conducive to plant growth? Is it too hot, cold, or windy for the establishment of vegetation other than pioneer growth requiring many years? Will the land be maintained and the vegetation cared for once it becomes established? To cut down on costly failures, the authors are convinced that revegetation specialists must know the answer to these and other questions before attempting to restore spoil land for timber, grazing, or other farm crops.

In their chapter on revegetation of spoil mounds, they recommend, in general, the planting of trees and shrubs on steep mounds and the making of pastures on ground that can be leveled. Areas reclaimed for pastures should, of course, be free from poisonous fumes. And topsoil should be spread on the surface or, if this is not possible, the surface should be conditioned over a series of years by mulching, growing mixtures of pioneer plants and disking in, fertilizing and using all available organic materials such as sewage sludge, and controlled grazing by livestock, as the plant succession is gradually built up to the haycrop-pasturage stage. Even then, the pastures must have the best of care year after year, else they will deteriorate rapidly.

Several useful planting tricks are revealed as one reads of unusually successful revegetation experiences in England and our Central States. For example, when converting an old spoil mound into a woodland, if there's a coarse sod on the site, cut out a square of it and place upside-down in the planting hole—then sow seeds of lupine in the inverted turf. And, in the final step of establishing pastures on spoil land, use many different legumes and grasses, both early and late, in the seeding mixture—and drill in the seed, 2 inches deep on the poorer areas.

—PHOEBE O'N. FARIS.

NOTES FROM THE DISTRICTS

COURT CONTRACT.—When the Fiscal Court of Logan County, Ky., entered into an agreement with the Logan County Soil Conservation District for a plan on the county farm, they asked the SCS planning technician to estimate the cost of the practices planned for application in 1950, so that funds could be budgeted. The court then inserted into its contract with the tenant operator of the county farm the following clause: "The tenant agrees to operate said farm under the supervision and orders of the Fiscal Court and according to plans, rotation programs, and soil conservation practices as recommended by the local soil conservation district."



GEORGIA RECORD.—About one-fourth of the farms in Georgia, containing nearly half of the State's farm land, have soil and water conservation plans which SCS technicians helped their owners prepare.

In the Ocmulgee and Flint River Soil Conservation Districts, farm planning has been completed on more than a million acres.

By last spring the Broad River Soil Conservation District in east Georgia had the largest number of plans—4,749, covering 593,031 acres.

Five other districts have passed the half-million mark in acres planned, and 13 districts have more than one-fourth million. Three of the newer districts have not reached the latter mark.

CONSERVATION WORKSHOP.—According to R. H. Musser, the Kiwanis district of which the Milwaukee Kiwanis Club is a member has made reservations for a 4-day conservation workshop beginning August 9 at the Trees for Tomorrow camp at Eagle River, Wis. Musser, regional director for the Soil Conservation Service, is a member of the Milwaukee Kiwanis Club's Agricultural and Conservation Committee, having served as chairman in 1948.

The Trees for Tomorrow camp has completed lodging and classroom facilities for 45 persons. Lectures and tours will be conducted by staff members of the State conservation department, the Forest Service, and other conservation leaders. The class this year will visit State forest projects, fisheries, nurseries, and wildlife developments.

CITY PROTECTS WATERSHED.—With assistance of SCS technicians in the Pine Mountain (Ga.) Soil Conservation District, the city of Manchester has developed a conservation plan for the protection of the entire watershed from which it obtains its municipal water supply. The water comes by gravity from three small mountain streams. The city has purchased the 1,400 acres in the watershed of the streams and is carrying out a reforestation program. About 320 acres of open land have been reforested and the remaining 200 acres will be planted within the next year. Adequate fire protection and wildlife-conservation measures are included in the plan. When reforestation is complete, a new reservoir will be built to increase the storage capacity of the municipal water supply.



Winners and trophy.

JINGLE CONTEST.—The board of directors of the Manistee (Mich.) Soil Conservation District recently conducted a contest among the six county high schools for the best slogan on soil conservation. The board sent each school 16 pieces of masonite, 8 x 12 inches in size, painted yellow and ready for lettering. Rules of the contest limited each jingle to not more than 16 words. The shop classes of the schools did the lettering for the entries chosen.

The lettered masonite signs, ready for highway use, were presented to the district board at its annual meeting, and judges were named to select first- and second-place winners. The winning jingle was written by Joanne Ware and Joan Nugent of Bear Lake High School: "Save Our Soil, Save Our Nation. Save It by Soil Conservation." The English class of Kaleva High School took second place with "Everybody Loses When Erosion Wins. Practice Soil Conservation."

Director Harry Taylor of the district board presented blue spruce trees to the winning schools. The trees will be planted on the school grounds.

LEGION SPONSORS PROGRAM.—The Georgia Department of the American Legion is sponsoring a community agricultural program based on soil conservation farming, community leadership, and farm management for the 100,000 veterans now operating Georgia farms. Awards are planned at post, district, and State levels, with the State award scheduled for October 15.

The Soil Conservation Service and other agricultural agencies are being asked to cooperate in carrying out the program and selecting the outstanding veteran "living on and operating" a farm within each area. In the soil conservation phase of the program, each veteran will be judged on:

1. Adequacy of his soil conservation plan.
2. Percent of his plan that has been applied.
3. How well he follows up and maintains his applied soil conservation practices.

LOAN CONDITIONED ON CONSERVATION.—When a soil conservation district in Wisconsin attempted to follow through on a request for a farm plan, it found that the farmer had developed cold feet toward soil conservation work. Inasmuch as the request had been turned in by a local bank, a report on the farmer's attitude was sent to the bank. Within a week the request was renewed and this time the farmer was ready to undertake all the soil conservation work recommended. His loan had been refused until he got soil conservation practices started on his farm.

TREES AND FIRST GRADERS GROW TOGETHER.—A unique forestry project was started at the Alfred, Maine, public schools when 22 first-grade boys and girls appeared before the student body and planted a row of 22 Scotch pines along the schoolyard fence. Each pupil did the work on one tree with his own hands and feet, under the direction of Delbert L. Moody, SCS conservationist, who prepared the ground. When the boys and girls finish high school 12 years from now, the trees, under normal conditions, will be twice as tall as the average graduate and will form an attractive screen against adjacent land from which highway fill is taken.

MONEY-MAKING CALF.—E. B. Stowers, chairman of the Conecuh River (Ala.) Soil Conservation District, bought a 340-pound calf on February 6 and put him in a field of Caley-peas, crimson clover, and tall fescue. Eighty-six days and 220 pounds later, when the calf weighed 560 pounds, Stowers sold him for \$128, or a profit of \$70. The calf had no supplemental feed.

ORPHANAGE GROWS BICOLOR.—The Epworth Orphanage in cooperation with the Congaree (S. C.) Soil Conservation District has planted 8 pounds of bicolor lespedeza seed. The boys at the orphanage expect to get about 30,000 seedlings this fall. One-third will go to the district and the remainder will be sold by the boys to yield them some cash.

STATEMENT PRINCIPLES

TEXAS BANKERS ASSOCIATION

Fort Worth, Tex.

May 15 and 16, 1950

SOIL AND WATER CONSERVATION

Members of the Texas Bankers Association recognize that productive land and a prosperous agriculture are essential to the economic welfare of communities, Texas, and the Nation. Texas bankers realize soil erosion by wind and water has already destroyed or damaged, and continues to damage, great areas of productive farm and ranch lands in Texas. Texas bankers know that the conservation and proper use of soil and water are necessary if the land is to be productive and our agriculture prosperous. We believe good progress is being made in conservation districts of this State, organized under the Texas State Soil Conservation Law of 1939.

Also, members of the Texas Bankers Association recognize that bankers have a responsibility in encouraging sound soil and water conservation in this State. And, so, we stress four points as follows:

1. We endorse work of the soil conservation districts and the Association of Texas Soil Conservation District supervisors, and urge bankers, individually, to support actively this work.
2. We suggest to the incoming Administrative Council of the Texas Bankers Association that a Committee of Soil and Water Conservation be set up to represent our association in counseling and working with the Association of Texas Soil Conservation District supervisors and with the Texas State Soil Conservation Board.
3. We recommend to individual bankers to become acquainted with and offer counsel to supervisors of their local soil conservation districts.
4. We recommend to individual bankers, who own land, that they ask assistance of their soil conservation districts in applying and maintaining a sound soil and water conservation program on their own land, and encourage other landowners to do likewise.

First Soil and Water Conservation Committee appointed by C. E. McCutchen, president, Texas Bankers Association, and president of First National Bank, Wichita Falls.

Claude Jones, chairman, Gainesville: W. Guy Draper, Temple; Pat Newton, Bryan; Ben L. Gill, Jr., Terrell; H. W. McGoldrick, Kenedy; T. C. Granbury, Dublin; W. J. Sloan, Brenham; J. M. Weinsapfel, Muenster.



At sign: Andy Sorenson, Earl Widemann, E. John Nielson; director, president, director, respectively, Gloria Soil Conservation District.

IDEA FROM THE FAR WEST.—The next time you travel through California by car, keep an eye on the roadside markers. There's a new kind out there that is getting a lot of attention.

The signs mark the boundaries of soil conservation districts. They are official signs of a standard pattern being posted this year by the California division of highways. They are uniform throughout the State in construction and appearance.

Through arrangements with local districts, the division of highways posts the signs at strategic points on main-traveled highways, and then turns them over to district boards of directors at nominal cost. The latter agree to take care of maintenance.

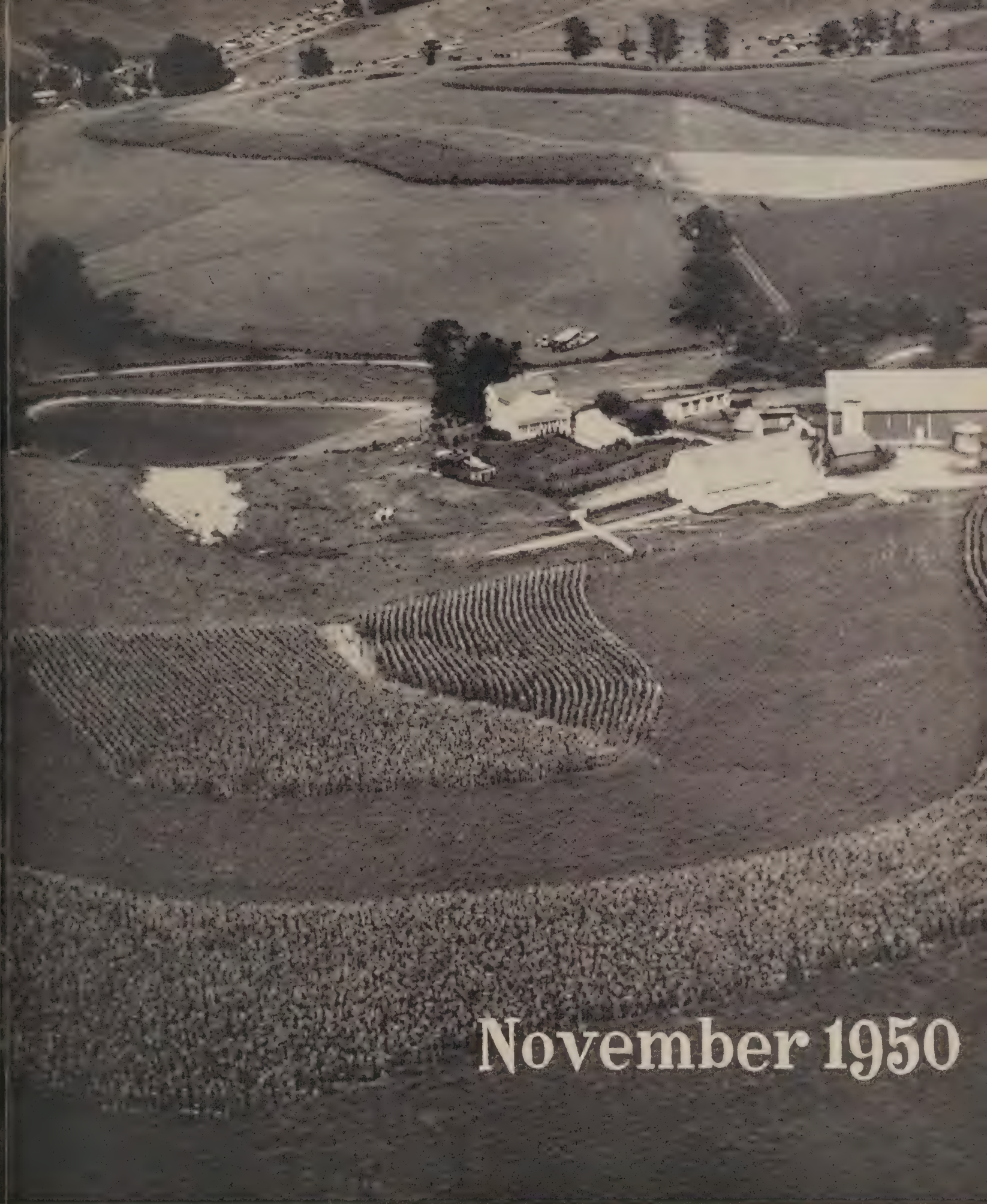
Among the first of the new signs to be posted are those marking the boundaries of the Gloria and Mission Soledad Soil Conservation Districts in Monterey County.



At sign: A. L. Roccick, Alfred Binsacca, Manley Sullivan; president, secretary, director, respectively, Mission Soledad Soil Conservation District.

On this farm at Corozal, P. R., soil and water conservation measures have increased pineapple yields from 8 or 9 tons per acre to 14 or 18 tons per acre. The new practices have made 4 crops possible instead of 3 within a 4-year planting period. The crop sells at \$40 to \$60 per ton. Perez Vivivas is the SCS work unit conservationist there.





November 1950

Soil Conservation

SOIL CONSERVATION.

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

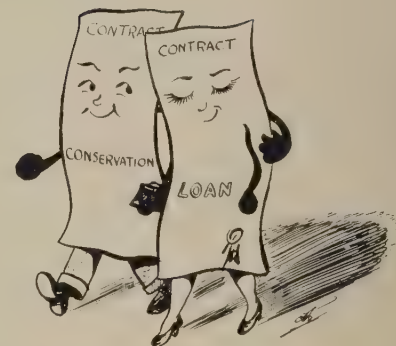
HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C

NOVEMBER—1950
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☆ THIS MONTH ☆

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CONSERVATION PROTECTS LOANS.—The financing of soil and water conservation measures is being given consideration by a large life-insurance company in its farm-loan program in the Roswell, N. Mex., area and other parts of the Southwest, according to E. O. Moore, chairman of the Hagerman-Dexter Soil Conservation District.

"This development," Moore said, "should be of interest to farmers and ranchers who wish to improve the productive capacity of their properties. The lending program is a definite encouragement to the conservation of water resources and a means of helping farmers to enjoy the increased benefits that accrue from proper land use."

The Mutual Life Insurance Company of New York has some \$1,000,000 invested in farm and ranch loans in the Roswell area and a substantial portion of this is being

(Continued on p. 84)

WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

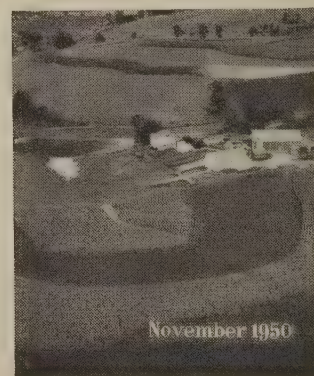
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FRONT COVER.—This photograph by Hermann Postlethwaite shows the Henry Lakin farm about 2 miles south of Jefferson, Md. This 200-acre dairy farm has a complete soil and water conservation plan, including farm pond, contoured fields, and other integrated practices.



From the hills bordering Jones Creek in the distance, water formerly poured down to flood bottom lands in foreground.



Clayton McCue at drop spillway on his father's farm, where a 40-foot gully used to run.



Roy McCue cultivating contoured corn on upper reaches of Jones Creek.

JONES CREEK PAYS OFF

By R. H. MUSSER

With soil conservation steadily assuming a more important place in the Nation's flood-control picture, more than usual interest attaches to an economic study recently completed on the Jones Creek watershed. This watershed is located in the Harrison County Soil Conservation District and the Soldier-Maple Valley Soil Conservation District in western Iowa. Jones Creek was one of the earliest examples of soil conservation treatment on an entire watershed in the United States.

There are few if any other watershed programs in the entire Midwest which have been operating long enough for us to evaluate long-range results. But the Jones Creek program was applied 10 years ago. And the study recently completed proves conclusively that the investment made there is paying off in benefits to individual farmers and to the public at large on a ratio of \$9 benefit for each dollar expended.

Among those who conducted the study under the direction of Frank H. Mendell, state conservationist for the Soil Conservation Service at Ames, were George Lamp, district conservationist at Sioux City, and Gunnar Brune. Brune is an economist and sedimentation specialist from regional headquarters in Milwaukee.

NOTE.—The author is regional director, Soil Conservation Service, Milwaukee, Wis.

Soil borings and measurement of sedimentation were made throughout the Jones Creek area. Results of improved cropping systems and land use were evaluated and all of the farmers who took part in this early project were interviewed. Present land conditions were also weighed against the conditions which prevailed before the program started.

At that time, gullies were a major problem because slopes are steep and water rushed down from them at breakneck speed. This 1,400-acre watershed, which is located about 6 miles southwest of Moorhead, Iowa, is typical of the steep land along the bluffs draining into tributaries of the Missouri. Sixty-six percent of it slopes more than 16 feet to the hundred, and the silt loam soil is highly erosive.

Under these early conditions, upland farmers were damaged both by gullies and sheet erosion. Tons of soil from their sloping fields were being carried down on the bottoms along the Soldier River, and valley farmers were spending thousands of dollars to dredge this hill soil from their drainage ditches.

This work was started before the soil conservation district was organized. The farmers are co-operators with the district.

The work on Jones Creek was done between 1937 and 1942, the bulk of it being completed by 1940. Technicians of the SCS first helped farmers apply a comprehensive program of improved land use. Approximately 80 acres of badly eroded land was retired from cultivation and developed as improved pasture. This had been producing large amounts of silt and trees. All of the remaining cultivated land was converted from straight-row farming to contouring. Existing pastures were also improved.

This new pattern of better land use was then bolstered by the construction of eight structures. These include five earth dams with concrete chute spillways and three with sod spillways. Three miles of gullies ranging up to 40 feet in depth were graded in and developed into gently sloping grass waterways.

All of this new water-disposal system leads into a 9-acre reservoir on the farm of W. R. Jones. This was formed by the largest of the earth dams. It is 48 feet high and 350 feet long. In this reservoir, 160 acre-feet of floodwater can be stored temporarily, feeding gradually down through a drop-inlet tube to the waterways below it.

The Soil Conservation Service contribution on this project was largely equipment and labor supplied by the Moorhead CCC camp and later by the Denison CO camp.

Upland farmers stood the major cost of converting their farming operations to the new soil-conserving pattern. And bottom-land farmers, who were being directly benefited, furnished money for materials. Four of them, Roy Seabury, Mrs. Ollie Johnson, Arthur Coe, and Sam DeCou, contributed \$2,800. "We don't regret it," Seabury said.

Today, approximately 10 years after the last shovelful of earth went on the Jones dam, the water-disposal system is still functioning perfectly.

The sediment pool above the Jones dam was designed to last for 20 years. It has already been in service 10 years, and the recent sedimentation study indicates it will function for at least another 10. The annual loss in storage capacity has been 6.22 percent, which is about the amount anticipated by design engineers.

In their report on the recent study, engineers state: "It should be pointed out that the reservoir could have been designed with a larger capacity if a longer period of storage had been desired. However, we felt that as conservation practices on the watershed became more effective over a period of 15 or 20 years, less sediment would be produced and a desilting basin would no longer be required."

That this conclusion was correct is indicated by the 10-year study. Before the program was applied, the watershed was losing approximately 21.3 acre-feet of soil per square mile annually. This soil loss has now been cut to 2.5 acre-feet, the study revealed, which is a reduction of 88 percent.

All but 0.4 of an acre-foot of this silt is being trapped and held in the upland reservoirs so that the amount of sediment going into the drainage ditches on the lower bottoms has been cut a total of 98 percent.

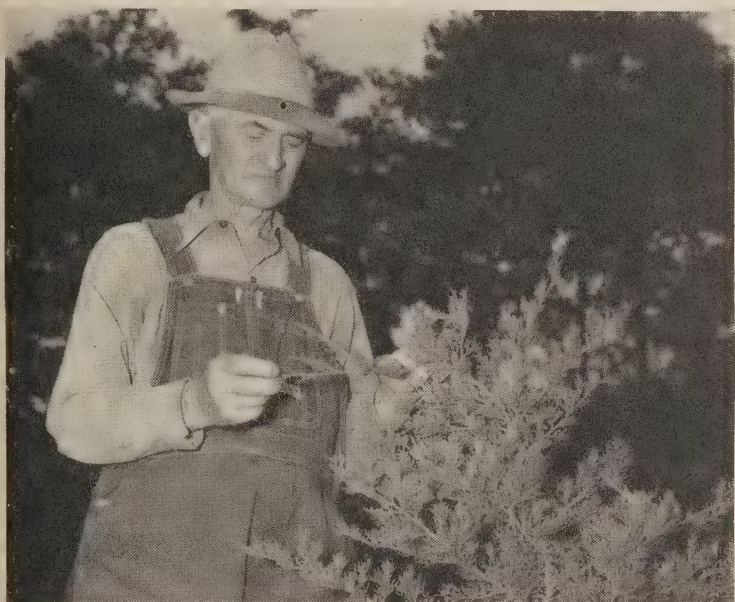
As to the bottoms where approximately 200 acres of crops were wiped out at frequent intervals, flooding has been eliminated entirely.

W. R. Jones operates 360 acres of land, 165 acres of which is under cultivation. "Before we put in these dams," he said, "20 acres of my best bottom-land crops flooded out regularly. It hasn't flooded since we finished this project. Two years ago this land that used to flood produced 100 bushels of corn.

"Before the program was put in, I had seen



Water impounded above the large Jones Creek dam provides recreation for Iowa farm boys.



W. R. Jones inspects plantings in a wildlife area on his farm.



Arthur V. Johnson says: "My 50 acres of bottom land used to flood at least every year. It has not flooded, however, since the Jones Creek project was finished."

water come rolling down here from the hills and the creek would be up to the bridge in 30 minutes. It would flood the whole bottom. It doesn't do that any more. The water backs up behind the

dam and the outlet feeds it out gradually so the ditches below never overflow. Our flood problem is over."

Just below the Jones land is the 311-acre farm operated by Lyle H. Carrigan. The watershed-treatment program had been completed before Carrigan moved on this farm. "I'd never have moved on this place without it," he said. "I knew how it used to flood. There were about 60 acres of this bottom land that would flood out; some of the best cornland, too.

"We haven't had a flood down here since they finished the Jones dam. The ditch used to get out all over the bottoms but since the work was done up there I have never seen it half full. It's done wonders for all of us."

The 328-acre bottom-land farm below Carrigan is owned by Roy Seabury, Pisgah businessman, and is being farmed by William Hall. "We've had as much as 150 acres under water," Seabury said. "It covered the bottoms from hill to hill and we lost a lot of crops. I'd say from 25 to 40 acres would flood every year. And some years we'd lose 75 or 100 acres of crops.

"All of this stopped when they put in that water-disposal system on Jones Creek. I'm sold on that approach to upland flood control 100 percent. I couldn't be otherwise. It's functioning perfectly and the money we put up was the best investment we ever made."

Arthur V. Johnson farms 280 acres below the Seabury farm. He had 50 acres that flooded at least every other year. "The work on Jones Creek not only solved our flood problems and saved us a lot of damage from crop loss," he said, "but it is also saving us a lot of money on maintaining our drainage ditches."

The source of this water and silt which formerly poured down on the bottoms from the roof of Jones Creek was found principally on four upland farms, and these hill farmers were being damaged as badly as many of their bottom-land neighbors. All of them were losing soil and water needed for crops.

Farmers on the upper watershed include Thayer Brown, Harry Rice, Roy McCue, and his son, Clayton McCue. Typical of the general feeling about the watershed program was the sentiment expressed by Roy McCue.

Three of the dams are located on his 200-acre farm and four more are located on the 240-acre farm of his son, Clayton.

"This has been a fine thing for all of us," the elder McCue said. "I had a gully out in the middle of that field 25 or 30 feet deep. Now there's a grass waterway a mile long where I mow hay for my livestock. My land and Clayton's is all being farmed on the contour and our yields are going up steadily. We don't have any gully trouble now."

The economic study, however, went beyond the successful operation of the project. Public money cannot be used on any watershed program, no matter how well it may be liked locally, unless the dollars-and-cents benefits are greater than the actual costs.

The analysis of Jones Creek after 10 years indicates that this project is paying off at an estimated ratio of 9 dollars for every dollar spent. However, if proper maintenance is provided, benefits will continue to accrue.

For the 10-year period the program has had a total benefit of \$321,110, according to close estimates. This includes reduction in crops losses and in cleaning sediment out of drainage ditches. Six or seven acres of land above the structures have also been reclaimed. This is now farm land where only gullies used to grow. Other benefit items are reduction in loss from both sheet and gully erosion and increased crop yields.

The estimated total cost of the project, based on 1940 prices, was \$34,555. On the basis of present prices, the report states the total cost to both the government and landowners would be about \$80,000, which is still less than one-fourth of the benefits up to the present time.

PUTTING TREES ON GUARD.—Based on experience with field windbreaks planted a decade ago, Johnson brothers, near Rolette, N. Dak., have started a program to establish similar windbreaks at 80-rod intervals on all the cultivated land in their 1,240-acre farm.

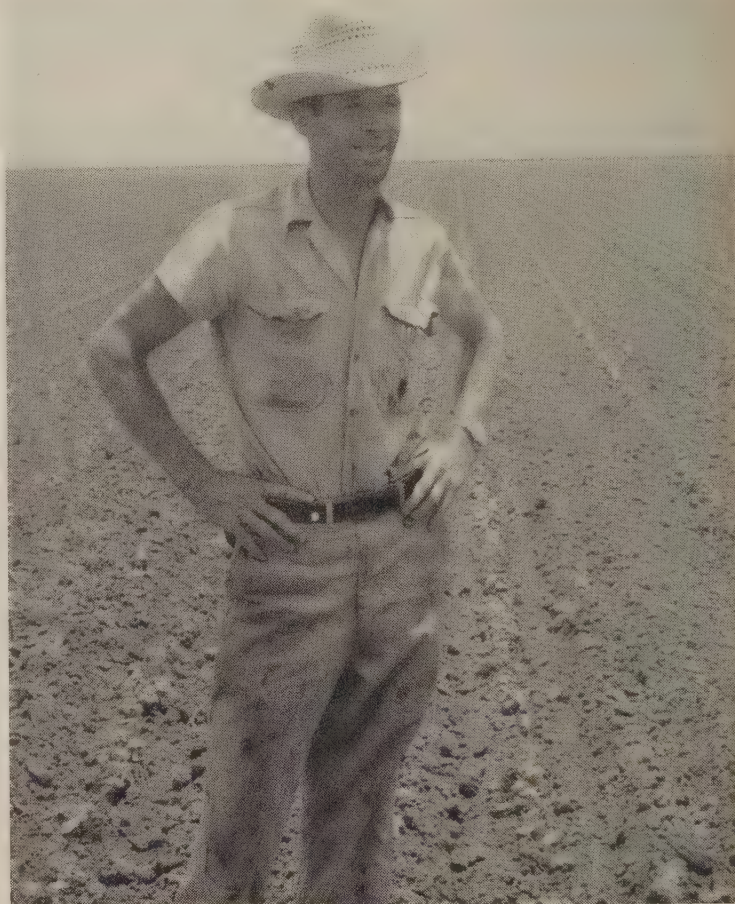
The land protected by the trees and also strip-cropped has been completely established in this area where wind erosion is a serious problem. The trees also help to keep snow from being blown away, thus allowing it to melt and soak into the fields.

"These trees," they say, "have shown their worth during the strong, spring winds. Plowing has usually begun by then, so the fields are bare and most likely to blow."

Johnson's tree-planting schedule is part of the complete conservation plan they worked out in cooperation with the Rolette County Soil Conservation District. Included in the plan are complete strip cropping, use of grass in the crop rotation, and management of crop residues to keep them on the surface as much as possible.

DISTRICT PROFILE

KAY MOORE
of
TEXAS



Kay Moore in the role he prefers.

When Kay Moore came home from World War II he found a man-size job waiting. The Moore brothers—Kay, Jay, and L. H.—had 1,400 acres to farm in the New Home neighborhood near Lubbock on the Texas High Plains.

But that wasn't all. Kay Moore soon found himself right in the big middle of soil conservation district work. He was elected a supervisor of the Lynn Soil Conservation District, then made secretary-treasurer.

In 1949 Moore was named a director of the Association of Texas Soil Conservation District Supervisors. On top of that, he is secretary-treasurer of the Lynn County Farm Bureau. And he teaches a Sunday-school class and attends veterans agriculture classes, to boot.

"In my spare time I try to farm 500 acres of land," Moore says.

Farming 500 acres of cotton, sorghums, and irrigated crops, and running a string of livestock, are enough to keep one man busy from sunup to sundown. But somehow Kay Moore manages to get in time for his "nonpaying" jobs.

Moore had a lot of time to make plans for his future on the farm back home, because he spent 2 years in an army hospital after the war.

He was a captain in a cavalry reconnaissance squadron, Eighty-seventh Infantry Division, in General Patton's Third Army during the last war. Just a few days before the war ended in Europe, he was wounded seriously. Then began his long hospitalization.

It was tough on a man with Moore's restless energy to have to slow down. He had had 9 years of army life. Before that, from 1936 to 1942, he had trained and ridden jumping horses for steeplechase events.

So when Kay Moore came home from the hospital he was rarin' to go. He hasn't slowed down a bit.

His brother, Jay, is a soil conservation advocate, too. He has a 160-acre irrigated farm in the High Plains. The Moore farms look like an oasis—in fact, all the farms in the New Home neighborhood do.

Farmers in the New Home neighbor group are all conservation farmers and they are finding ways of growing new cash crops where folks used to think cotton was the only thing that would flourish in their area. They are developing irrigated pastures and raising cattle, hogs, and sheep. They aren't worried about getting more land. They are trying to take care of what they have now and make it more productive.

The Moore brothers are typical of the New Home neighborhood. Jay Moore says he'd rather have his \$10,000 concrete-pipe irrigation system than another section of unirrigated land.

Crops that put humus back in the soil leave a protective cover or mulch on the land during the blow season. That's the answer to the wind erosion problem, Moore thinks.

—HOMER A. TAFF.

130 MILLION GALLONS.—Should they run into another severe drought, such as last year's, Allegany County (N. Y.) Soil Conservation District cooperators have an ace waiting in the form of 160 farm ponds. They have 130 million gallons of water in storage for spray, irrigation, and stock use—plus fire protection.

IT WAS AN EXCELLENT YEAR

THE 1950 record of the Soil Conservation Service received the following comment from Dr. Hugh Bennett, Chief of the Service, in a letter to all regional directors:

"I have just had a look at our accomplishments for the fiscal year 1950. They are exceptionally good and I want to congratulate you and those who work with you. We don't know what lies immediately before us with respect to facilities for getting work done this fiscal year, but I am hoping we can find ways for getting ahead. At any rate, we have good reason to be proud of last year's accomplishments. All of the regions made substantial progress.

"Technical assistance was provided to 2,199 soil conservation districts. Conservation surveys covered 31,400,000 acres—up 22.0 percent. Conservation plans were prepared for 132,752 farms (39 million acres)—up 20.1 percent. Altogether, combined conservation practices were applied on 26 million acres—up 17.9 percent. Technical services to districts amounted to 9.2 percent more than during the preceding fiscal year.

"Average costs per acre for surveys, planning, and treatment decreased from \$1.80 in 1949 to \$1.67 in 1950—a reduction of 7 percent.

"The soil and water conservation work completed in the fiscal year 1950 was equivalent to 2.7 percent of the total conservation job. This was nearly three times as fast as was our progress in 1943, and more than double our rate in 1945, although facilities had not been increased in any such proportion.

"I am certain that the percentage of the job done annually can be raised to around 4 percent. Until our work with neighbor groups gets into full swing, we will not have done our best. . . .

"We are now well into fiscal year 1951, but if we glance back at 1950 I believe we can all find plenty of encouragement to make this year even better than that. Let's try to do so with all our strength. We are a progressive organization. Let's not stop being progressive, come what may."

SOIL CONSERVATION RESEARCH IN THE SOUTHEAST

By B. H. HENDRICKSON

AGRICULTURE is continually faced with serious problems, but the most puzzling of all is what to do about poor land.

Many of our farmers, especially in the South, have left the farms and gone off to the cities to hunt jobs. Poor soil and the outworn kind of farming that many of them practiced are the principal reasons.

On the face of it, the situation demands that we go to work and find methods and types of farming that do fit our conditions. And how is this to be done?

Some say we should establish productive close-growing cover crops or winter grazing by fertilizing heavily. But it is not quite that simple.

The old way was by trial and error—a costly method. That was the method of our ancestors, coming into a new and virgin country. I daresay that none of us now living can fully comprehend the disappointments and failures of the pioneers. Gradually, they found farming methods that worked pretty well. First, they sought to produce food and feed crops, then cash crops and products for market. But then, too often, there followed a period of exploitation at the expense of the soil upon which we all depend.

Later, agricultural colleges were formed, agricultural experiment stations established, and as a result, newer and better methods of farming gradually developed. Commercial fertilizers, unknown to the pioneers, came into general use. Education and extension was followed by financial and technical aid to farmers, which has been greatly expanded in recent years. Efficient production became the watchword and still is essential to profitable farming. But until about 20 years ago, not a great deal was being done to combat erosion.

Specialized soil conservation research was then undertaken at a few localities in this country in order to find the basic facts. Where, when, and under what soil, slope, and crop-cover conditions was the erosion loss most serious? Finding out

these and other basic facts was a prerequisite to a scientific job of designing conservation-farming methods for even one of the many problem areas. Research was a necessary prelude to the action program that began in 1933.

Agricultural workers have learned a lot of new facts about our land in recent years. Conservation research stations and special projects are continuing to supply the new information on which our progress in soil conservation so largely depends.

Some people, who may think that by now we must surely have enough agricultural research, farm application, educational and demonstration work under way, should remember this: At every flood stage many of our large streams still run bank-full with muddy water carrying away to the seas in a matter of seconds the equivalent of all the topsoil of an entire farm. Each fraction of an inch of topsoil lost means damage to the land. Erosion invariably means the loss of a valuable asset to the farmer, and to the Nation. Under the least damaging conditions, erosion always costs money and extra effort to compensate for its land-deteriorating effects. At the Southern Piedmont Conservation Experiment Station, we have found that the loss of topsoil has resulted in markedly lowered crop yields of cotton, corn, and various other crops.

Basic facts, properly interpreted, permit the formulation of plans. Let me quote some examples:

(1) At the Southern Piedmont Conservation Experiment Station, soil and water losses from sloping row-crop land were found by research to be much greater during the spring and summer than during fall and winter. In fact, three-fourths of the annual soil losses were found to occur during 6 months of the main growing season, rather than during fall and winter, as many had previously supposed.

(2) Certain adapted close-growing summer legumes were found to be highly protective both as growing cover crops and also as stubble-mulch covers during the winters. In fact, the stubble-mulch aftermath following harvesting was found

NOTE.—The author is project supervisor, Southern Piedmont Conservation Experiment Station, Soil Conservation Service, Watkinsville, Ga.

to be more protective than any winter cover crop planted for that purpose.

(3) When turned under in the spring in preparation for a year of summer row cropping (and here was the biggest surprise), the legume crop residues made the soil more absorptive, much less erosive, and much more productive. Furthermore, we now know that the consistent use of a practical conservation rotation of this type grown over a period of years on cropland of average slope reduced water losses by one-half, soil losses by seven-eighths, and increased the per-acre crop yields materially. Soil aggregation and organic matter content were also improved. We call this "progressive conservation." It means real progress.

These favorable results have focused attention on the potentialities of good conservation agronomic practices. It is to be noted that these agronomic methods accomplish much more than merely conserve the soil. They improve the soil and increase its productive capacity while maintaining protection.

These effects are of great significance to fertilizer specialists, crop specialists, agricultural engineers, farm economists, and many others in allied professional agricultural fields. Much is to be gained by mutual hearty cooperation and exchange of factual information, in order to accomplish ultimately the over-all aim of all agricultural workers, which is to help establish an enduring, prosperous agriculture.

Soil conservation research is particularly directed toward the land—all of it, its best utilization. For profit, for efficient production on "good land," only? Decidedly no! It includes protection, restoration, improvement to adequate productive levels, and maintenance—good land use for every acre.

The ultimate aim is a fully developed, adapted, sustaining agriculture that will stand the test of time. Never before has there been a land program as comprehensive as this.

In parts of this country—notably the Southeastern States—we hear much talk about the "revolution in agriculture" that is now in progress. As a matter of fact, we are now engaged in changing over from the old to the new; from the cotton-corn economy to a better balanced crop-livestock pattern. This is also a conservation pattern, designed to protect and improve our farm lands. We all agree now that it must be a conservation pattern in order to reach our ultimate goal.

At this stage, how many of us know the answers to the problems that lie ahead?

It is characteristic of agriculture that it continually faces perplexing problems. Farmers, busy making a living, have little time or opportunity to experiment. They cannot afford to fail. There are many failures, along with successes, that mark the history of all research. And there is no end to the challenges in the program in which we are engaged.

In this fast-moving scientific age we can ill afford to sit back complacently and say, "We know enough now, let's apply what we know." By all means, speed the application, but do it the time-tested way to avoid blunders and be sure that our work is sound and based on research.

There is no known substitute for the tested results of research, to keep us from getting "bothered," like the aged Negro who said:

"Nossuh, Boss, 'taint what ah don't know that bothers me, it's what ah believes to be true which ain't so!"

While marked progress has been made in reducing soil and water losses, much needs to be done.

We need, first, a better understanding of our soils, both in the condition we now find them in 1950, and as to their potentialities under good conservation management. This, in itself, is a large order.

Our SCS conservation surveys and the grouping of soils according to land-class capabilities have greatly facilitated conservation farm planning. But we need to know more about soil permeability and infiltration capacities, and how to evaluate the various factors involved in the wide differences that occur.

If infiltration and permeability of an upland agricultural soil, for example, can be increased, then volume of runoff water will be reduced, erosion loss decreased, the growth of crops generally benefited, and flood hazards lessened.

Wet lands often are difficult to drain—they become much less difficult if they can be made reasonably permeable. The grower who uses supplemental irrigation during dry spells wants the soil to soak up water rapidly. He, too, is interested in keeping his soil permeable.

Other physical characteristics of soils have direct relationships to conservation soil-management methods.

Contributions that soil conservation researchers can make to the science of hydrology, especially

with reference to the control of water as it affects conservation agriculture and reduction of the flood hazard, are manifold and important.

Forests, cover crops, and mulches protect the soil surface from the direct impact of pelting raindrops, greatly increase infiltration, and reduce runoff. However, the control of overland flow of runoff occasionally resulting from excessive rates of rainfall remains a serious problem. Studies of the design, construction, and maintenance of field terraces and meadow outlets need to be continued, especially with reference to farm-machinery problems that are involved. Land drainage methods, to include the control of ground-water levels, are pressing problems in extensive wet-land areas in the Southeast. Supplemental-irrigation methods adapted to the varied conditions of soils, slopes, crops, and water supplies need further investigation.

Studies in the realm of plant ecology are especially significant. We need additional studies with introduced plants and with many new plant combinations and successions to determine the effective ground covers under a wide variety of conditions. Upland pasture-development possibilities have focused attention on the need for studies of this type, for the reason that successful pasture plants are largely on their own and must succeed and perpetuate themselves in spite of grazing and trampling and the competition of various species of vigorous weeds. The development of plowable pasture, grass-legume sods that may form the "base crops" for improved conservation rotation practices, is a vital need in the Southeast.

Over the whole vast area of the Southeastern farming lands, we need competent investigations to better design, develop, and test practical cropping methods of conservation type that will be most effective for soil and water conservation under the diverse conditions found in this area, and to meet specific land-use requirements. Some 35 such cropping methods are under test at the Southern Piedmont Conservation Experiment Station, Watkinsville, Ga., but this station is the only one in this region that has concentrated on this type of investigation for a number of years.

The South may well become one of the richest agricultural sections of the United States by reason of its long growing season, adequate rainfall, and responsive soils. But before this attainment can be reached, there must be marked changes

in methods. In the hilly sections particularly, large acreage reductions in row crops and corresponding increases in close-growing forage crops and pastures are inevitable, due to the erosion hazard.

Practically all of the crops that hold and improve the soil are utilized as forage. These crops have a relatively low acreage value. This situation calls for more efficient land-use methods than has been necessary in the past in the production of most of the high-value row crops. For this reason, additional research ought to be directed toward the solution of practical land-use problems involved in forage-crop production on the varied land classes, soil types, and soil-productivity levels encountered in the Southeast.

One of the really important contributions to the agricultural sciences has been the discovery by Soil Conservation Service researchers of the role of close-growing crop residues in conservation cropping practices. Crop-residue management—including stubble mulching—needs further investigations.

Certain crop residues are potent factors in erosion control, and soil improvement as well. A few years ago no one would have thought that lespedeza residue turned into the soil could possibly reduce erosion during the following row-crop season by two-thirds, but it has done so repeatedly in the Southern Piedmont. If residues can be retained more nearly on the soil surface, it is known that soil losses will be further reduced because the litter can then serve to break the force of pelting raindrops that otherwise churn up the unprotected mineral soil, disperse it, and stimulate soil loss into the overland flow of surface runoff waters.

Climatic and physiographic hazards peculiar to certain sections, or problem areas, of the Southeast need further study as a basis for determining the feasibility of establishing certain types of crops, covers, and uses for particular classes of land.

Finally, we will end this incomplete list of soil conservation research needs in the Southeast by urging that the most effective methods we now know be demonstrated in various parts of the Southeast on experimental conservation farms where adequate records can be kept of all operations. One of these 100-acre, tenant-operated conservation farms has been a going business proposition on part of the lands of the Southern Piedmont Conservation Experiment Station since 1941.

No single research endeavor has meant so much to the thousands of farmers who come to the station for information as this one farm. It illustrates the practical application of conservation cropping methods according to land-class capabilities of a typical farm. It includes cash crops, pasture development, livestock operations, adequate diversity of crop and livestock products, good labor distribution, equitable tenant-landlord relationships, and good profits for both—with substantially increased inherent productive value of the farm land as a by-product.

Soil conservation research, all of which is cooperative with the State experiment station systems, needs to be supported and extended to serve more of the diverse problem areas in this country. And such research, set up on a sufficient scale to include practical demonstrations under field- and farm-operating conditions, can become a center of great educational value to the thousands of farmer-visitors who come to hear, to see, and to learn about soil conservation and its benefits. What actually has happened in Georgia, and elsewhere, is that over the past decade large numbers of farmers have made tours to experiment stations. Many of them either have gone ahead and put into practice on their own farms methods they have seen to be proved soil conservation practices, or have voluntarily sought advice and assistance of work unit conservationists and county agents in their home counties.

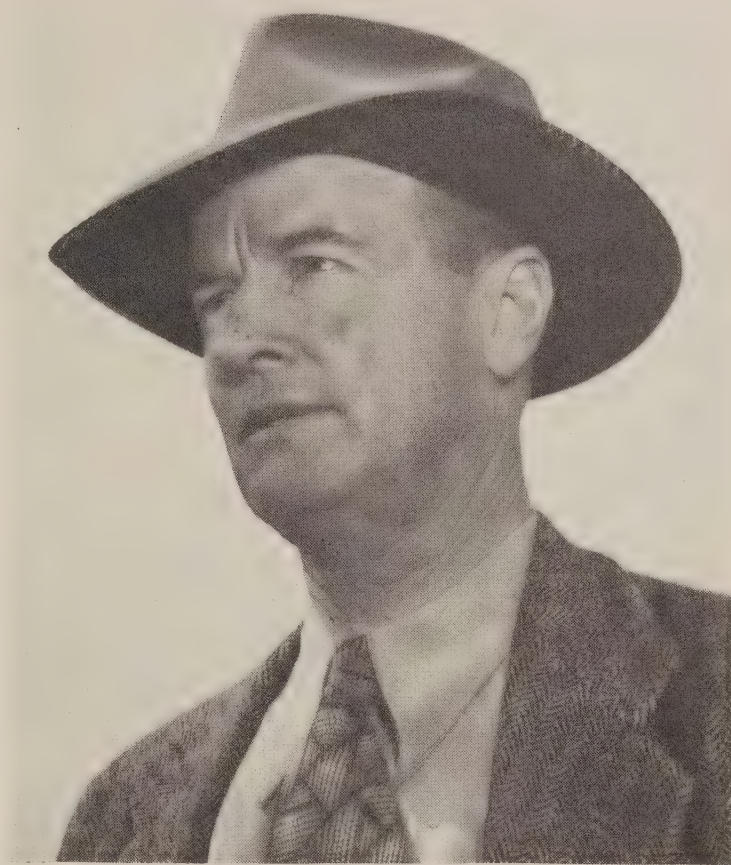
It is a fact that soil conservation research results command respect, especially when presented in their proper setting, namely, on the land. Large numbers of farmers will copy successful land-use methods provided that they are practical, promise to be profitable, and fit the conditions on their own farms. We need more of this type of research.

Some soil conservation research must be of basic technical character. But the popular appeal of demonstrated practical research results must not be overlooked, for in the last analysis it is the farmer who must apply conservation methods over the broad areas of our Southland.

ALL READERS NOTE.—Does your copy of **SOIL CONSERVATION** Magazine arrive in good condition? Are you pleased with the way it is wrapped and mailed? I shall be glad to have your comments by postcard or otherwise.

WELLINGTON BRINK, Editor.

GRASS-AND-CATTLE FARMER



Henri P. Watson.

By V. E. AHLRICH

HENRI P. WATSON, chairman of the Holmes County Soil Conservation District commissioners, is highly respected by both white and colored people in this part of Mississippi. The reason: His continued efforts to help others.

This mild-mannered, soft-spoken man lives in Lexington, county seat, where he was born fifty-odd years ago. After receiving his degree from the University of Mississippi, he studied agriculture at the University of Illinois and was offered a teaching job there. Instead, he chose to farm back home.

Looking after his 2,000-acre plantation in the Mississippi Delta and a 2,115-acre farm 4 miles west of Lexington keeps Watson pretty busy. But he finds time to take vacations and to render public services. Usually, he vacations in the Northwest, in Florida, or in South America. His visit to

NOTE.—The author is district conservationist, Soil Conservation Service, Grenada, Miss.

Argentina last year was motivated by a desire to learn more about grass-and-cattle farming.

As chairman of the Holmes district commissioners, member of the Production and Marketing Administration committee, member of the soil conservation committee of the influential Delta Council, and member of the flood control committee of the State Association of Soil Conservation District commissioners, he finds plenty of outlet. He is a Rotarian and an elder in the Presbyterian Church.

Watson's deep-rooted love of soil makes him an enthusiastic supporter of wise land use. He's always seeking better ways to conserve soil and water.

Watson began in 1940 to change from row crops to grass on his big farm near Lexington, where he spends most of his time. This switch was completed in 1943. Watson realized that the rolling-to-steep land, with an occasional creek or branch bottom, was better suited to grass-and-cattle farming. He also concluded that grass was more profitable and required less labor, a scarce item during the years when his son, his only child, was at war.

A total of 1,114 acres of grazing crops keeps Watson's 300 Herefords well fed. Tall fescue, Dallisgrass, Bermuda-grass, lespedeza, wild winter peas, oats, Ladino clover, white, hop, and crimson clovers cover this large acreage. About 300 acres of this pasture are in creek and branch bottoms ideally suited to grass. Nearly 400 acres more are in the rolling hills of deep brown loam which also grows grazing crops well. The other 414 acres are in rugged, steep but fertile hills typical of this part of the brown loam soil belt of Mississippi.

Watson started the growing of wild winter peas (also called Caley-peas) in the Delta. Today this legume is recognized as this area's best winter cover crop.

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used for conservation measures and other improvements.

This means, to the lending institution, the best possible security for a farm or ranch loan.

The Mutual Life will require, of course, the same assurance of the borrower's ability to repay the loan that any good lending institution must have. But it believes that proper land use and economical water use can greatly strengthen this assurance. Where the management is good, furnishing the necessary additional funds to pay the cost of conservation practices is regarded as good business for the company, as well as of benefit to the farmer or rancher.

WOODLAND'S VALUE DRAMATIZED FOR 20,000

By WILLIAM J. LLOYD

NEAR Seattle this spring, a large dairy farm had its face lifted. Some 20,000 people turned out for the event. It was the largest and most spectacular conservation display ever staged in the Pacific Northwest. Does the story sound familiar? Don't stop reading if it does. Because there's a story behind the story that you probably haven't heard.

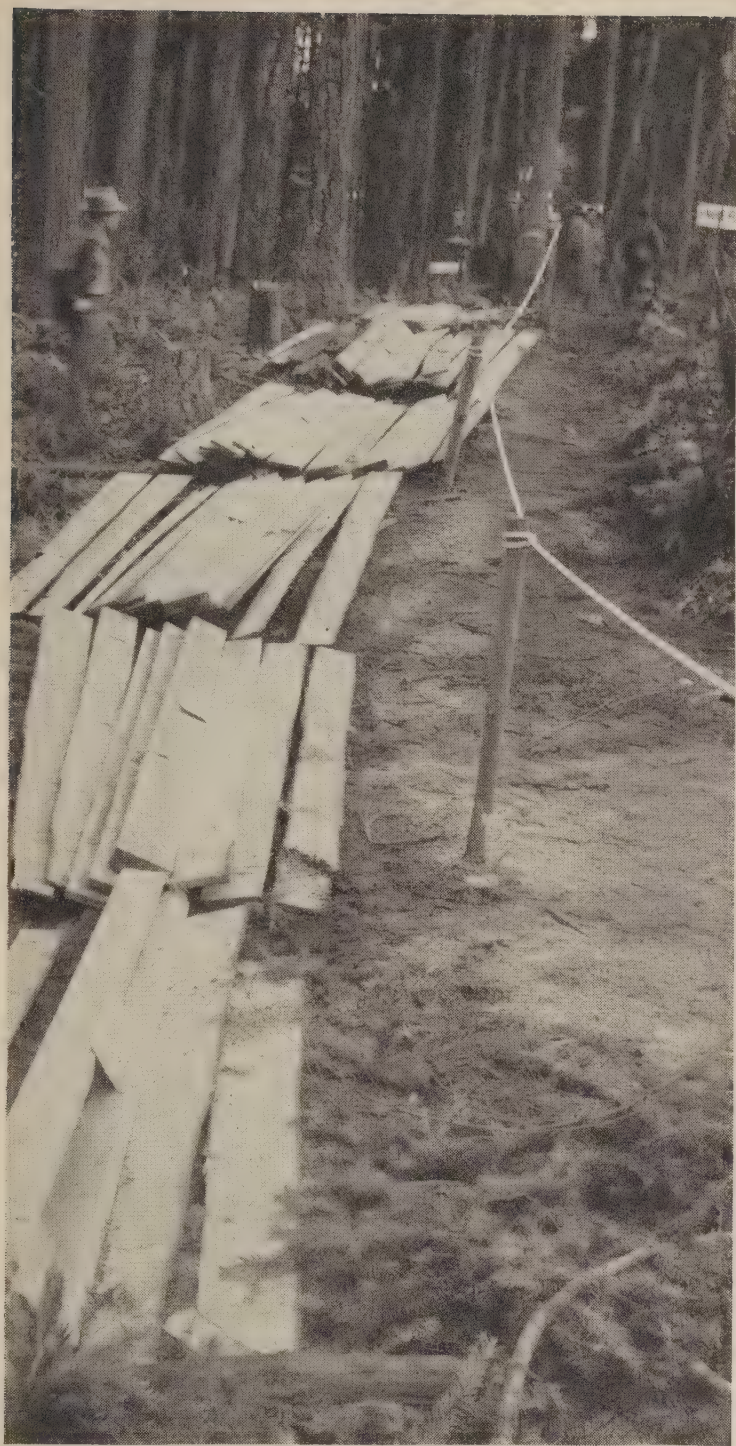
When the King County (Wash.) Soil Conservation District and the Seattle Chamber of Commerce announced their plans for remaking the Marymoor dairy farm on the outskirts of the city, they advertised woodland management as one of the features of the day. They neglected to explain fully, however, the important part that materials taken from the woods were to play in the mammoth undertaking.

One of the first sights to meet the eyes of early spectators, was a string of long, narrow, wooden boxes which stretched for nearly a quarter of a mile across a soggy, swamp-like pasture. The boxes were cedar drains, to be laid end-to-end in trenches which would be dug later in the day by heavy power equipment. Before the day was done, the drain boxes would be buried as part of a badly needed underground drainage system.

Most spectators were amazed to learn that the lumber for the drain boxes had come from long-dead cedar trees, many of which had lain in the nearby woods as waste perhaps a hundred years or more. They were further intrigued to learn that the boxes were entirely of "home manufacture." Salvaged cedar logs and chunks had been snaked out of the farm woods a few days before and sawed into lumber on the spot by a mobile sawmill, set up on the Marymoor Farm.

Cedar boxes have been used for underground drainage in the Pacific Northwest for many years. Under certain conditions they are considered su-

NOTE.—The author is forester, Soil Conservation Service, Sedro Wooley, Wash.



This is how an "exploded" tree looked to spectators.

perior to tile. Many farmers prefer their wooden box drains. But until the Marymoor demonstration, few realized the ease and low cost with which they could obtain a cedar-box drainage system from their own woods.

While thousands of people milled about, the mobile sawmill continued to convert products from the woods into valuable materials for use on the farm or sale to nearby markets. An accompanying photograph shows part of the crowd which watched while the mobile unit made high-quality building materials from a continuing supply of second-growth fir logs.

Behind the steady stream of logs trucked to the saw during the day, was another conservation story. Just half a mile from Marymoor Farm lives a neighbor, Oscar Wellman, who owns and operates a peach and cherry orchard. Wellman has a 3-acre woodland, a dense 50-year Douglas-fir stand in which he takes great pride. Shortly before plans for the Marymoor event were announced, Wellman had begun excavation for a new home. Here were the ingredients for an added and unusual attraction for the face lifting. A new home requires lumber. A dense fir stand should be thinned. Thinning would produce saw logs. The mobile sawmill could turn logs into lumber. The sponsors and Wellman reached a quick agreement. The woodland was thinned. Logs were moved to Marymoor Farm during the day where they were turned into lumber along with the cedar slabs and chunks mentioned before. The lumber—more than 9,000 board feet—eventually went into the construction of a new home.

Many asked how Wellman's woodland looked after the thinning operation. The answer is: Far better than before. The thinning was planned to create improved growing conditions for straight, clean, healthy trees by removing trees which were crooked, crotched, limby, and were crowding the better-formed trees.

While spectators at the sawmill watched, an expert from the Bureau of Lumber Grades and Inspection of the West Coast Lumbermen's Association conducted a lumber-grading demonstration. He graded boards as they came from the saw, showing the crowd how and why each board was graded as it was. Over half the lumber graded better than No. 1 common. There was very little No. 2 common. To show the crowd some No. 3 and No. 4 common, boards were *borrowed* from another mill.

What happened to the slabs and sawdust? That's another conservation story. The slabs and edgings were "buzzed" into firewood for the wood-burning stoves on Marymoor Farm. The sawdust was used for bedding material in barns and mulching material in gardens and orchards.

Not far from the sawmill, 4-H boys showed the use of pentachlorophenol as a preservative treatment for round Douglas-fir fence posts. This practice has application on thousands of farms where young stands of timber can be thinned to provide needed fence posts.



Part of the crowd which watched a mobile sawmill convert woodland products into valuable materials used in the remaking of Marymoor Farm.

For those hardy souls who pushed on up the hill and into Marymoor's woods there was even more to see. First was a demonstration of the use of a minor forest product, sword ferns. These are highly prized by commercial florists. Collecting ferns in the woods is a fairly new industry in western Washington but it is rapidly assuming major proportions.

Beyond the fern picking was a portable chipper at work reducing slash, limbs, and small poles to chips usable as fuel, bedding, or mulch. This portable outfit demonstrated a multitude of possible uses. Farmer-spectators volunteered scores of ideas for using such a machine in their own woods.

Next was an "exploded tree" demonstration voted by most visitors as the "best thing I've seen." This was an 18-inch Douglas-fir tree which had been cut down and bucked into short lengths. Each length was then sawed into lumber and the lumber, slabs, bark edgings and all, laid back into their respective positions between the stump and unused top. The tree sawed out 452 board feet of lumber, enough to build a small chicken house. Each pile of lumber representing the particular log of the tree was labeled as to amount and grade.

The woodland-marking demonstration followed the "exploded tree." Here visitors were shown how the 70-year Douglas-fir stand could be thinned

to improve quality and increase growth of trees. Nearby, two men with a portable power saw bucked cull logs into firewood showing use of that type of equipment.

Final attraction of the woodland program was a shake-splitting demonstration. W. F. Peterson, a woodland cooperator of the Snohomish Soil Conservation District, was in charge. Splitting straight shakes, feather-tipped shakes, and shake boards for the visitors, Peterson spiced his demonstration with a line of patter that would have done credit to a professional circus barker. "Cedar shakes," Peterson pointed out, "can be cut from salvaged dead chunks, stumps, and slabs in almost any farm woodland. Surprisingly, two types of people use shakes—those who can afford *anything* and those who can't afford anything else and so are forced to fall back on their woodlands for this fine roofing material."

Behind the shake-splitter's humor and good-natured satire, however, was a significant fact that very few spectators missed. Farm woodlands are far more valuable than most people realize. The point was made clear to the thousands of people who included the woodland program in their day-long tour of Marymoor Farm. They saw with their own eyes how farm woodlands can supply valuable materials for farm and home use and supplement farm income besides.

HE PIONEERED SOIL-DISTRICTS LEGISLATION

By J. E. CRITZ

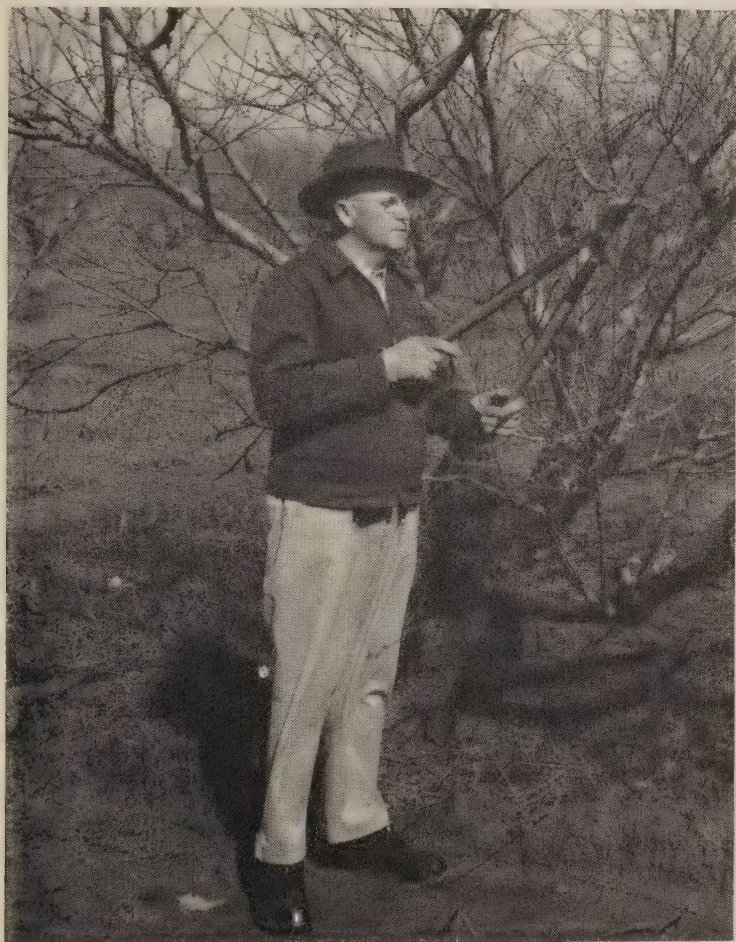
THE man who introduced the bill that became the first soil conservation districts law in the country isn't satisfied with what's been accomplished.

"Don't misunderstand me," says Elbert S. Graham, of Lowell, Ark. "We've gone places since Arkansas enacted the first soil conservation districts law back in 1937. But I'm impatient. This business of saving our soil is so vital, so deadly serious, that I want to see the job done all at once, overnight.

"To get the work moving faster, we need more technical help. Why, we have hundreds of farmers in this district waiting for technical help in mapping out a conservation plan and putting it on their farms.

"Lack of heavy equipment has handicapped our

NOTE.—The author is with the Soil Conservation Service, Fayetteville, Ark.



Graham prunes peach tree. Note orchard cover crop.



Graham and Orrin J. Henbest, SCS technician, go over a point in Graham's conservation farm plan.

work, too, though the county court has been most cooperative in hiring out county machinery to district farmer-cooperators. We are hoping to get the equipment we need to carry out our conservation program faster."

It was a stroke of good fortune for soil conservation that Graham was named chairman of the agricultural committee of the Arkansas House of Representatives in 1937. Soon afterward a model soil conservation districts law from the Department of Agriculture was placed in the hands of the agricultural committee chairman. It so happened that Graham was already interested in soil conservation. He had noted erosion on his own 250-acre farm and had taken steps to control it. He had been reading Hugh Bennett on the erosion problem and what to do about it.

So Graham took a serious, personal, and enlightened interest in the model bill. He studied it carefully before offering it to his committee. The committee studied it for 2 or 3 weeks. Graham had to overcome some opposition but finally the bill was reported out favorably to the House. Then the fight began.

The chairman ran into serious and stubborn opposition on the House floor. "It looked as though I were alone in trying to get this bill approved," he recalls. "It was argued by opponents that the farmers would be forced to do things they didn't want to do. Another stumbling block was that a lot of east-Arkansas farmers had lost their farms because of drainage district levies

and there was a great deal of bitterness from that part of the State."

Graham tried to meet each objection with logic. Finally, becoming exasperated, he shouted:

"This is the first time Uncle Sam has realized there are farmers in this country. Let's all get together on this bill for the good of all our farms."

The opposition melted. The bill passed the House, glided easily through the Senate, and the Governor quickly signed it. Thus, Arkansas went down in history as the first State to enact a law authorizing the creation of soil conservation districts, those subdivisions of State Government brought into existence by the vote of the affected landowners and managed by the farmers themselves.

Elbert Graham had to change a lot of his thinking. Like his contemporaries, as a boy he had been drilled in standardized ways of farming. He has always remembered one admonition from his father: "Whenever you plow a field, be sure the rows are straight." And from the way his dad spoke, Elbert knew he meant it.

When he grew up Elbert Graham began to abandon the old pattern. Noting the erosion that

was eating away his own farm, he built diversions and a terrace system to carry excess water off safely.

"I saw that I had to make the water walk, not run, down hill," he says. "That's still one of our major problems in Arkansas. And to make the water walk, we've got to have lots of grass—lots more than we have now."

In 1937, when he saw that his 70-acre apple orchard set out in 1901 was getting too old to produce well, he sawed down every tree and put all but 16 acres into pasture and meadow. In the 16 acres he planted peach trees.

That was his start toward a grass and hay economy. He has since pulled out 33 more acres of apple trees and replaced them with peaches, alfalfa, and pasture. He now has 44 acres in peaches, 42 in apples, 31 in alfalfa, (selling surplus hay), 10 in row crops (string beans), 15 in woodland that supplies his fence posts, and 100 in improved pastures of bluegrass, ryegrass, English perennial ryegrass, tall fescue, Korean lespedeza, white Dutch and hop clover. The pastures furnish ample grazing for his 50 head of Hereford cattle.

(Continued on opposite page)



Graham with some of the 11,000 broilers which are an important part of his diversification scheme.

CONSERVATION'S NEW LEADER IN THE NORTHEAST

By HUGH F. EAMES

ON THE land, at radio school, over the seas, in engineering work all over the country, wherever he has been and in whatever he has done, George R. Heidrich, Shenandoah Valley farmer, has crowded a heap of living into his 48 years. He's gotten a lot out of life largely because he has put a lot of better living into the lives of many other people.

NOTE.—The author is in current information, Soil Conservation Service, Upper Darby, Pa.

(Continued from preceding page)

In 1931 Graham began raising chickens, primarily to get fertilizer for his land. He gradually enlarged his flock as his locality became one of the country's major broiler centers. By this year he was raising 33,000 broilers annually in lots of 11,000 at a time. With natural gas available for the first time, he was planning to increase his flocks again.

"Farmers here, using their land properly, can produce milk on pasture and also have a profitable chicken business," Graham points out. "The two go hand-in-hand."

When the Benton County Soil Conservation District was organized, Graham did not immediately become a cooperator. He didn't want it to seem that he was receiving any special favors because of his legislative position. For the same reason, he declined to become one of the five original supervisors chosen to manage the district. It was not until April 1942 that he became a district cooperator. He was the one hundred and fifty-seventh farmer in the district to sign an agreement to apply a coordinated soil conservation program to his land. On December 24, 1941, he was elected supervisor, a position he still holds.

Many changes in land use have been brought about by the district's conservation program. Graham lists some of the results as—

Two milk plants, a cheese plant, and a cannery that has been enlarged to take care of the increase in the yield of tomatoes from 3 up to 16 tons an acre. Increases in yields of strawberries and other truck crops. Seven poultry plants that process broilers for market.

It was New Year's Day 10 years ago that George gave up his engineering career. It was then that he quit playing around in a part-time absentee-owner role on his 60 acres in Bucks County, Pa., and with his wife Trudie and their two children started to do exactly what he had always wanted to do—be a real farmer.

For this fresh start on a 259-acre run-down farm, 4 miles from historic Charles Town in West Virginia's eastern panhandle, they had very little money. They substituted an abundance of courage, confidence, and ability, and they needed all these qualities, because the outlook on this cold, bleak holiday was anything but cheerful. Almost before the family had settled down at the farm hard luck struck a cruel blow. As a starter, George had bought a flock of 170 ewes heavy with lamb. While he was trucking them 300 miles to the farm, they were caught in a blizzard and nearly a third of them died.

By drawing on their reserves, the Heidrichs contrived to start anew. What was left of the flock of ewes, plus a carload of Hereford heifers from Kansas City and a registered Domino bull, gave them the livestock foundation for the 100 ewes, 97 Herefords, 100 hogs, and 3,000 turkeys that they own today. George has fattened as many as 720 pigs in a year. He has increased the productivity of his soil until he has some of the best pasture and alfalfa in the valley, and is outstanding as a farmer in a county where good farming is the rule rather than the exception.

The Heidrich enterprise is nearly 100 percent grassland farming, with corn hardly showing in the program. The accent is on alfalfa, brome hay and bluegrass pastures, well fertilized and under good management. A multiflora-rose fence has been started and two farm ponds have been built, largely for stock-water purposes.

The Heidrich story had its start in cities—Philadelphia, Pa., for George, and East Orange, N. J., for Trudie. During the summer, between school years, George worked on a large south Jersey truck farm, where the "farming bug" bit him. By the time he finished high school at 18, he was convinced that he wanted to farm. But



George R. Heidrich.

when fall came he was enrolled in a New York City radio school. There he earned an operator's license and a commission to go to sea. His brother Bob, 16, also was inclined toward the sea, so George gave up his commission to look after Bob; and the two, working as stokers, spent 13 months on the waves.

Having talent and a little training for drawing, George then became a draftsman for a Newark, N. J., engineering firm. He went to night school, studied engineering, and advanced to field supervisor of installations. He met an attractive secretary at the home office, Miss Gertrude Conrad, and in 1931 she became his bride.

George's engineering work took him all over this country and gave him a multitude of useful experiences, but he could not get away from the pesky agricultural bug that had bitten him in Jersey. He read all the farm books and publications he could get his hands on. He kept his eyes and mind open and learned a lot about farming, so absorbed a wealth of new ideas. He never missed an opportunity to visit a livestock farm and talk with the farmer.

In 1937 George bought a 60-acre farm in Bucks County, Pa., and moved there. It became the usual city-farmer deal, because his engineering

work allowed him little time to farm. The operation soon saw George handling a small flock of purebred Southdown sheep and leasing the rest of the place to a farmer.

Of course, this kind of farming wouldn't do. Out of his experiences, reading, and observations during the next few years, Heidrich formulated an idea of the kind of farm he wanted. It must be big enough for livestock, have good soil, be well located in a strictly agricultural area, and be the right place to bring up the children they had adopted—George, Jr., and Gretchen.

They found and bought their farm in West Virginia in the fall of 1940, after selling the Pennsylvania place. On the first day of the year the Heidrichs joyously arrived at their new home—long called The Hermitage Farm—ready to become real farmers.

Even more remarkable than their progress in farming has been their quick and complete acceptance, although outlanders, by farm people of the community—county, State, and elsewhere—as rural leaders. At home George and Trudie are active in community, church, school, and civic affairs, and have devoted much time and effort to help make Jefferson County a better place to live.

Two years after his arrival in the eastern panhandle, George was elected a director of the county Cooperative Wool Pool. Next year he worked effectively to get his county into the Eastern Panhandle Soil Conservation District, and since 1944 he has been one of its supervisors. In 1946-47 he became president of the Jefferson County Farm Bureau and has since served continuously as a director. At the same time has been elected as one of the State Farm Bureau directors, and in 1949 he was reelected.

Meanwhile, George continued to do such an outstanding job in advancing soil and water conservation and the district program that he was appointed to the State Soil Conservation Committee. For 3 years he has been chairman of the legislative committee of the National Association of Soil Conservation Districts. At the organization's 1950 sessions in Atlanta he was elected regional vice president for 12 Northeastern States.

The healthy respect that farmers and other rural people have for unassuming George Heidrich and the confidence that is generally held in his judgment are reflected in the recognition that has come to him as a natural leader.

CART WHEELS CAUSE GULLIES.—In India, as in many other poor countries, two-wheeled oxcarts are the most common means of transporting people and goods short distances.



Young gully starting from cart tracks.

These iron-tired wheels cause severe damage to roads and have been worrying the highway departments a long time. The damage is particularly bad in villages where the roads are usually unpaved. When heavily loaded, the carts cut deep, leaving a pair of fair-sized tracks which collect rain water during the rainy season. Where-



Old gully which got its start in a wheel track. Newer tracks show at left.



Sloping meadow completely ruined by gullying. It started in cart tracks.

ever such tracks happen to be along the slope of a rolling landscape, the water rushes down along them, cutting deeper and deeper. In the course of a few years, gullies develop and keep on extending.

Indiscriminate running of oxcarts across uncultivated fields and native meadows is also common in India. Lack of a sufficient number of roads is probably the main reason. In such cases, when wheel-track gullies become large, the carters swing a little to the side, because there is always plenty of space available, and start a new track. When these, in turn, create gullies, the carters shift over a little and start new ruts. Within a few years, the process results in a whole series of gullies, which destroy more and more of the better land each year. Vast stretches of land, completely devastated for ages, stand out today as evidence of what can happen due to carting alone.

— P. SEN.

Trainee, Soil Conservation Service; formerly botanist, Soil Conservation Research, Santiniketan, India.

NOTES FROM THE DISTRICTS

NO MORE BAKED APPLES.—Three years ago, forest fires ruined the apples on the trees at Henry Brock's fruit farm near Lyman, Maine, because he had no way to fight off the flames. Now, with young tree plantings in the ground, he's getting a faster-than-usual start with new orchards, plus fire protection and spray and irrigation services. These come from the two farm ponds and the three 1,000-gallon storage tanks.

As a result of irrigation, Brock says he is getting heavier foliage and better root systems in his fall-planted stock, and indications are that the trees will come into bearing earlier than usual. While most Maine orchardists hesitate to plant in the fall because of the danger of winter-kill, Brock did not lose a tree. During dry periods, such as in recent years, fall plantings, when the trees are fully dormant, get off to a better start the following spring, says this farmer. That is because the root systems are able to absorb the earliest moisture.

For irrigation, Brock is using a war-surplus pumper, canvas hose, and aluminum pipes.

SAMPLE SPEAKS FOR ITSELF.—Soil structure and organic matter was the theme of the summer meeting of the Empire State Chapter of the Soil Conservation Society of America, held in Syracuse and Marcellus, N. Y., August 17 and 18.

Unique feature of the program, which was mailed in advance, was a cellophane envelope containing soil, which was attached to the cover. "Bring this soil with you," the recipient was instructed.

On the back cover was the explanation: "The soil in the envelope is from the Soil Conservation Experiment Station at Marcellus. Measurements show that soil losses there by erosion have been great. We hope that you will not contribute to these losses by failing to return this soil when you come to the meeting. Soil structure and organic matter are building blocks of soil conservation."



This silt was collected in a grassed waterway near Santa Fe.

GRASSES AGAINST THE RAIN.—Grassed waterways, or natural drainageways covered with native or introduced grasses, have made their value known to ranchers cooperating with the Santa Fe-Sandoval Soil Conservation District, according to Glenn Burrows, SCS technician.

"During unusually heavy rainfall recently, waterways covered with a protective coat of grass and other vegetative growth suffered little or no damage, while unprotected runoff channels were eroded severely," he said.

"Primarily, the grass covering in the waterway slows the runoff of the water from a nearby hillside and forms a protective mat over the ground," Burrows explained. "However, it also catches silt washed from unprotected areas.

"Recent actual measurements of soil accumulation on 160 acres of good cover grasses on a waterway south of Santa Fe reveal that they caught about 5,000 tons of silt in 1949 from a 10-section runoff area that had not been given proper care."

According to Burrows, the real value of a grassed waterway comes when the area above the drainageway is maintained in good condition by protective coverings of grass. He said the only way a good grass cover could become established is by reduced stocking of livestock and letting the present grasses get a good growth and spread themselves over the area.

Some 280,000 acres within the Santa Fe-Sandoval district and 100,000 acres under agreement by ranchers on the La Bajada grant have had proper grass management and have suffered little damage from recent heavy rainfall.

TIPS ON FIRE PROTECTION.—The value of a firm approach to the edge of a pond was demonstrated at C. E. Cassel's farm near Hummelstown, Pa., when fire fighters permitted flames to destroy only a large implement shed and the farm equipment housed in it. They saved the barn, several small buildings, and farm houses, valued at close to \$30,000, when they kept the fire away from gas and oil tanks. Damage was held to about \$1,000 because the firemen had more than 1½ million gallons of water to use—far more than needed.

A contractor built Cassel's pond in 1947 at a total cost of \$320, in which the main item was \$212 for 17 hours' work with a caterpillar and carry-all. The pond, built

primarily for livestock water, has a surface area of about 1½ acres and is supplied by water from a small spring and some of the surface runoff from about 50 acres.

Firemen told Cassel that they must be within 15 feet of a pond to get the most efficient pumping, never more than 25 feet away. They must be closer when centrifugal or rotary pumps are used and priming is necessary. The end of the hose should be in the pond at a good depth, and should be protected if there is a mud bottom. The pumper should stand on the level. Slopes impair efficiency. Nearby fire companies made test runs to the Cassel farm when the pond was built and had no difficulty getting into effective action there when they came to do real business. Consult your local firemen and work with them in developing the right kind of an approach at the right spot, Cassel suggests.



THREE DISTRICTS FLY TOGETHER.—Three soil conservation districts in the Palouse section of eastern Washington and northern Idaho added something new to their annual field days this year. Instead of holding three separate events, as in the past, the districts joined forces and sponsored an air-ground tour of all three districts, as well as the soil erosion experiment station and the soil conservation nursery at Pullman, Wash.

The districts were the North Palouse and South Palouse in Washington and the Latah district of Idaho. Headquarters for the tour was the Moscow-Pullman airport, midway between the Idaho and Washington cities. District supervisors arranged for five commercial airplanes to take participants on the air phase of the tour. Several hundred farmers turned out for the event. About 70 made the trip by air before rejoining the ground party.

Those who never before had seen their farms from the air returned with greatly increased importance of erosion. General comment was to the effect that they didn't know it was "that bad." An Idaho wheat farmer summed up the group reaction with the remark, "I'm glad I didn't see my place from the air first or I never would have bought it."

FACE-LIFTING SEQUEL.—The famed Nellie Thrasher farm, near Frederick, Md., continues to improve steadily since the spectacular face lifting in August 1948. Independent appraisers, in their second annual report, made the following condensed observations:

Hay: 30 tons from 22 acres; 95 tons of grass silage from 25 acres of pasture land; 40 bushels of orchardgrass seed (a new side line) from 5 acres; 26 acres of growing hay (alfalfa, timothy, and alsike mixture) in fair condition,

with an indicated yield of one-half ton per acre; 20 acres of permanent pasture (bluegrass and white clover) in excellent condition. The entire hay production, because of the amount of pasture "compares more than favorably with 1949 production. Hay generally in the current season is producing 50 percent of 1949 production."

Wheat: 13 acres, 23.4 bushels per acre, 305 bushels. County average is 18.6 bushels per acre. Government-loan support price is \$2.25 per bushel.

Oats: 6 acres, 50 bushels per acre, 300 bushels. In 1949 the average yield per acre was 40 bushels. Present market price is 90 cents per bushel.

Barley: 6 acres, 66 $\frac{2}{3}$ bushels per acre, 400 bushels. Last-year yield was 20 bushels per acre. The present market price is 95 cents per bushel.

Corn: 19 acres of growing corn, 1 acre more than last year, in excellent condition.

Milk: Operation has been established in DHIA basis for 3 months. Excellent results—"nothing short of miraculous"—primarily due to "proper feeding and elimination of nonprofitable units." In May 1950, it was one of the 25 highest-producing herds in Frederick County, with an average butterfat test of 4.35 and an average production of 43.1 pounds of butterfat per cow. In 1949, with an average of 25 cows in the herd, milk production totaled 224,760 pounds. In the first 6 months of 1950, from 30 cows, the production was 119,228 pounds. Six cows will be fresh from now through December. Seventeen heifers are being raised.

Pond: The farm pond is continuing to produce an abundance of fish. A small portion of the excess has been used to stock two additional ponds.

Real-Estate appraisal: No real-estate appraisal was made this year "primarily because the greatest difference in comparison is obtainable from other appraisals previously made," but, the appraisers note, "It is our conservative opinion that a reappraisal would show an even more favorable condition." The first annual reappraisal, made a year ago, showed \$26,400 as compared to \$13,625, the appraisal made just before the face lifting.

The 1950 appraisal was made by E. Earl Remsberg, Charles Covell, and S. Saylor Weybright.

FLEXIBLE GRAZING.—Better control of grass and cows has pushed beef production on the Malcolm Stewart ranch, near Las Vegas, N. Mex., well above the average for the area, says Eamor C. Nord, Soil Conservation Service representative.

Nord, who is working with the Mora-San Miguel Soil Conservation District, reports that Stewart's production of beef per acre will rise above the 15-pound mark during 12 month's grazing. The area average falls below 12 pounds per acre each year.

Nord credited Stewart's success to a flexible grazing program enacted when he took over managership of the 18,700-acre ranch 2 years ago.

"We carry through fewer yearlings and steers but they are of good quality," Stewart said recently. "As a result, our gains per acre actually are greater, although we carry a smaller herd than many ranchers do."

When Stewart took over the ranch 2 years ago, his herd had to go as far as 2 to 3 miles for water. He developed



Nord, at left, discusses with Stewart the value of winter wheat as winter pasture in the Las Vegas area.

one well, four pit tanks, and four dams to bring water within a mile at any point. He cross-fenced his range to give better rotation and control of his herd.

The fences and water developments give Stewart full utilization of his available grasses, which is extremely important this year because of the prolonged drought.

"The control program is paying extra dividends this year," Stewart declared. "My carry-over grass equaled about half of the total production last year, when we grazed 1,000 head. The number was cut to 750 head this year in order to guarantee a good start next year."

His pastures are predominantly blue grama, western wheatgrass, and side-oats grama, most of which is in excel-



The Malcolm Stewarts and Sam, their cocker spaniel, relax at their home near Las Vegas.

lent condition, Nord notes. Some winter wheat is grown primarily for winter pasture.

Trial plantings of tall wheatgrass, intermediate wheatgrass, and weeping lovegrass dot the ranch. The intermediate wheatgrass is showing extra promise as a forage producer for this area. It greens up in January and is still palatable in the summer, giving more grazing than the improved native grasses.

Gradually shifting to a cow-steer-calf operation, Stewart prices his calves at yearlings, while the cut-backs, or those not sold, are carried over to the feeder market or to the 3-year-old class. The system is typical for this area.

Supplemental feeding is done only in the winter when snow covers the range and when protein content of the grass is down. Cake, for added protein, is fed from mid-December until the first spring rain when the grass greens again. Hay is fed only during storm periods.

"The 24-year-old Navy veteran is one of the district's most avid and successful cooperators," Nord said of Stewart recently. "His work on his ranges is showing others what they can do and expect from a top grass-utilization program."



TRINITY WATERSHED BLANKETED.—The Fraternity of the White Heron and the Forward Trinity Valley Association pay fitting tribute to soil conservation districts in their 1950 progress report on work accomplished in the Trinity River watershed.

"The all-important Texas soil conservation districts, recognized broadly as the most democratic farmer-land-owner groups, now cover virtually every bit of the 17,500 square miles of the challenging Trinity Valley, or watershed," the report points out.

The only territory in the Trinity watershed not within a soil conservation district is a small patch of San Jacinto County. Seventeen soil conservation districts share in the responsibility for controlling floods on the agricultural land of the Trinity. With Soil Conservation Service help, their job is to control erosion and water runoff on private farm lands of cooperators on Trinity tributaries.

CONSERVATIONIST PICNIC.—Lake Itasca not only is the source of the Mississippi River, but it was also the site for the first annual picnic of district supervisors, county agents, and SCS personnel last July. Conservationists and their families, numbering about 100, came from most of the 10 districts of the 2 work groups in northwestern Minnesota.

Excellent talks were made by Superintendent of Schools Wermager, of Fergus Falls, and Rev. O. T. Haaland, superintendent of the Lutheran Memorial Home in Twin Valley. The place of soil conservation in school studies was presented by Wermager in his talk. He pointed out the importance of teaching in the primary grades the principles of soil and resource conservation. He emphasized the importance of instilling in the minds of the students the importance of nature's balance and the penalty paid when this is not respected. Haaland stressed three points of the Creator's commission to man, namely: (1) Inhabit the earth, (2) subdue the earth, (3) replenish the earth. He cited examples of improper land use and the resulting waste. He commended the group on their

contribution to "replenishing the earth" through soil conservation measures. Luther Monson, student from Luther College, entertained with songs and led group singing. Plans have been made for next year's picnic.

—EINAR HENDRICKSON.

POTENT PICTURE.—An SCS picture of hairy indigo appeared in the *Atlanta Journal* with a Darien, Ga., date line. Within 3 days, District Conservationist D. C. Chapman and Coastal District Supervisor Clyatt Middleton received inquiries about the summer legume from these places: Georgia—Carrollton, Sardis, Statesboro, Zebulon, Montezuma, Moreland, Cordele, Pelham, Chipley, Adel, Dawson, Cairo, Gough; South Carolina—Greenwood, Estill, Florence, Olar, Greenville, Allendale, Rock Hill; Tennessee—Jonesboro; North Carolina—Asheville; Florida—Alachua.

Wanting to know more about hairy indigo for soil improvement were a bank president, a newspaper editor, a veteran trainee instructor, a vocational agriculture teacher, an SCS technician and nursery manager, farmers, seed dealers, and dairymen.

EXPERIENCE WITH BROME.—When neighbors looked at Dick Turrell's new seeding of smooth brome at West Oneonta, N. Y., in the fall of 1949, they laughingly called it a "weed patch." They were accustomed to timothy, alfalfa, Ladino, and even birdsfoot trefoil, and wondered if Turrell's cattle would ever touch the coarse new stuff.

Last July the same skeptics were saying, "Dick has the best hay plantings in this area." The cows love this grass, which is especially good on land subject to spring flooding.

Turrell planted 8 pounds of brome and 5 pounds of birdsfoot to the acre in the spring of 1949. That year it was clipped to kill weeds. Last July the growth was higher than 8-year-old Bob Turrell's head and had a thick undergrowth of clover. The vigorous second growth will be used for a second cutting or for supplemental pasture. Dick Turrell says there should be no cover crop for a new seeding, because smooth brome works better without one.



MORE GREEN PASTURES.—The Green Pasture idea keeps catching on in New England. In the 1950 six-State competition for county, State, and regional awards, 3,016 farmers have enrolled. This is a gain of 249 over last year. Rhode Island and Connecticut show declines of 39 and 25 respectively, but the others are up, with Vermont leading through its gain of 194 farmers. The gains of the others are: Maine 29, New Hampshire 60, and Massachusetts 30.

WINTER INCOME.—When Jim Aberegg, 26, got back from the European and Pacific theaters of war in 1947, he settled down in Wetzel County, W. Va., where he purchased a 133-acre farm, enrolled in the GI agricultural training work, and started dairy operations. Half the farm is in woods and most of the rest so steep and rough that it will grow only grass for his 18 cows and heifers. Needing extra income, Jim and his dad went to work in the woodlands and have cut over 13 acres. Although most of the trees are old and large beech, usually considered poor stuff, they have produced 50,000 board feet of mine timbers and 20,000 board feet of lumber marketed at \$40 and \$60 per 1,000 feet, respectively. Jim does the work in the woods and his father operates the mill. Jim has fenced the woods to keep the cows out and has planted many young trees, including white pine for future Christmas trees. He has established good woodland-management practices.

CUCUMBERS.—John H. Book, owner of Book's Pickle Patch, a Lancaster County (Pa.) Soil Conservation District farm, went into the 1950 season with no fear of drought because he knew he had enough water to meet irrigation needs. Book built a half-acre pond last year and filled it with water piped from a marsh area 1,250 feet away. When pickle crops began to deteriorate rapidly from lack of water, Book hitched his overhead portable irrigating outfit to the pond and gave the "cukes" all the refreshment they needed. Ordinarily the harvest season runs 7 weeks. Through use of an abundance of pond water he prolonged it to 10 weeks. He got better results from his crop, he says, because the pond water was warmer than water pulled from underground.

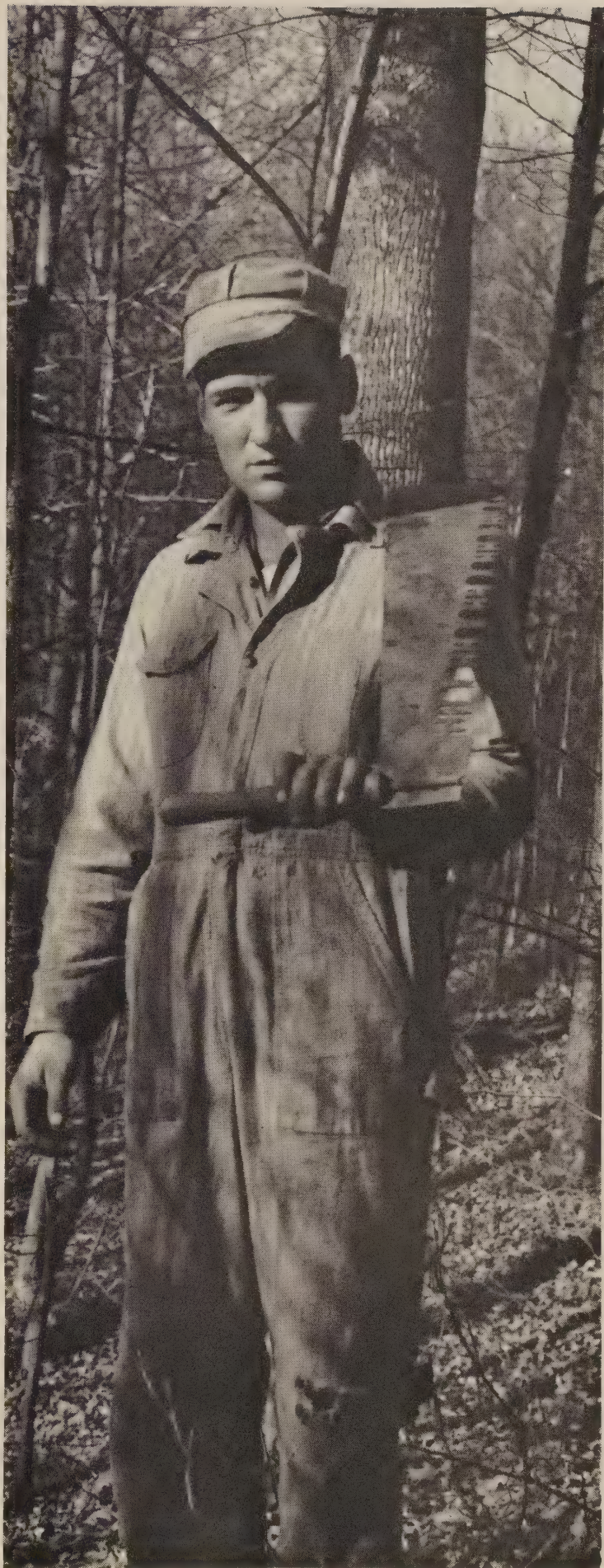
EVENTFUL 7 DAYS.—During the Soil Conservation District Week held in Texas, early reports indicate that 57 districts held 142 tours, with a total attendance of 7,237. Fifty-seven districts met with civic clubs in a total of 131 meetings, with 9,224 attending.

A total of 192 soil conservation district supervisors and cooperators spoke to civic clubs and other organizations.


An incomplete tally shows that 310 sermons on soil and water conservation were preached on May 21.

A total of 49 district dinners were held in 33 soil conservation districts with a reported attendance of 6,313.

FIRE DEPARTMENT WANTS MORE PONDS.—The fire department of Benson, Vt., in Rutland County, places a high fire-protection value on farm ponds. Recently it sponsored a public meeting to interest farmers in pond construction. More than 100 persons attended. Soil conservation district and Soil Conservation Service representatives explained how each helps in farm-pond planning and construction. In the 13 soil conservation districts in Vermont, 665 farm ponds have been constructed by farmer-cooperators for whom complete conservation farm plans have been made.



Jim Aberegg finds extra farm income from mine props and lumber.



Ladino clover is one of the great new crops which have become popular under the program of soil and water conservation. Here is a fine stand in a sheep pasture on the farm of C. Shaw, Chichester, Merrimack County, N. H. The photograph was made by Gordon S. Smith in the fall of 1949.



December 1950

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SOIL CONSERVATION •

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☆ THIS MONTH ☆

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

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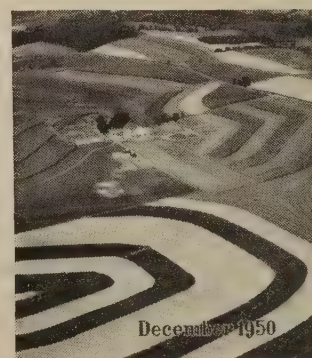
TIME IS MONEY.—Land leveling on 39 acres of the Glenn Seeley farm near Stanfield, Oreg., has reduced irrigating time from 6 weeks to 6 days annually.

Seeley, cooperating with the West Umatilla Soil Conservation District, leveled his 39-acre field in 1948. With the help of SCS engineers, he also improved his field ditches and made the change-over from wild flooding to border irrigation. Alfalfa was planted the same year.

"Before this field was leveled, it took me about 2 weeks per irrigation to get water over it. Now I can do a better job, using much less water, in 48 hours," Seeley said.

Seeley figures on three waterings a season, which means that he now saves about 36 working days a year. He also figures his alfalfa crop for two seasons will pay the out-of-pocket expense of getting the field in shape.

—BOB SWANSON.



FRONT COVER.—Strip cropping, on contour of course, on five farms of the Tocopson Creek watershed, Chester County, Pa. An intensive drive is on, using the medium of neighborhood meetings, to bring into the conservation program all 75 farms on the watershed. The photo is by Hermann Postlethwaite.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

BETTER FARMING BRINGS HAPPIER LIVING

By CAL ROARK

Twenty-seven years of renting and row cropping the other man's land—the best years of one's life, from 28 to 55

Twenty-seven years in the fields from sunup 'til sundown—toiling with an old mule and a single-stock plow, breaking, planting, cultivating, picking cotton

Twenty-seven years raising six boys and two girls, thinking that "if I don't plant nearly the whole place to cotton we'll perish." . . .

Twenty-seven years of washing and scrubbing and cooking and sweeping a yard free of grass, without the aid of home conveniences

THAT'S the kind of picture 58-year-old J. B. Weaver and his wife painted for me when I visited them recently at their 176-acre farm 6 miles south of Hartwell, Ga.

But it's all different now. Fact is, life on this Hart County farm is about as different now as daylight is from darkness.

The Weavers own the farm that they rented for 27 years. They bought it 3 years ago, paid for most of it with 1 year's earnings, don't owe a dime on it now.

They sat in lawn chairs out on the soft grass sod while the hot Georgia sun filtered through a canopy of pecan tree leaves, as they told me how different life is for them now. A few yards away their house beamed from the effects of \$3,000 spent on renovations and modern home equipment.

Two children still at home share the comforts and pleasures of good farming. Only 41 miles away, two other children attend the University of Georgia. And two sons farm nearby.

Near the Weaver home, tractors and combines and equipment that goes with them stood in readiness to do with ease all the things which once made farming so hard.

I jokingly chided the burly farmer about staying home in the shade while others worked hard in the



Weaver checks oat field and figures the crop of 50 bushels per acre will be ready to combine in 10 days.

NOTE.—The author is information specialist, Soil Conservation Service, Spartanburg, S. C.

dry cotton fields beneath a broiling sun. "I worked hard for half a century. I think it's time to slow down," he replied.

Weaver is one farmer who could slow down. The garden nearby needed little attention other than harvesting, which could be done in the cool of the morning. The fish pond beyond beckoned only when fishin' was good. The dense, cool, 3-acre patch of pines set in 1931 wanted only to be left alone to grow tall and straight for poles and saw logs.

The 90 acres of oats and wheat asked only for a few more weeks to ripen before the combines whipped the plump grains from their heads and flung the straw back on the land to make it richer. Underfoot, the tiny Kobe lespedeza plants cried only for the grain to be harvested so that they could cover the gentle slopes with a dense, rich growth.

Across the road in front of the Weaver home, a wide curving strip of tall fescue and Ladino clover enclosed by an electric fence continued to grow and ripen seed for another year's planting elsewhere. Beneath it rested the remains of a waist-deep gully where muddy waters once angrily surged toward the Savannah River after every hard shower. All this meadow waterway seemed to call for was refreshing runoff water from terraced fields covered with oats and lespedeza. Weaver could only wish for that, and wishing came easy on that new grass lawn—the first grass they'd ever had in their yard.

The only row crop on the 125 acres of cleared land was 8 acres of corn, and it required little attention on the richest land available. Lime and fertilizer and legumes made this and other land on the Weaver farm grow crops fast and yield bountifully. On one 20-acre field last year Weaver's son saved 1,000 bushels of oats and \$1,100 worth of Kobe lespedeza seed.

In the lowland pasture fields 18 grade and registered cattle—the beginning of a beef herd of 50 brood cows—harvested their own feed by choice. Fifty acres of Weaver's best land are now in fescue-clover pasture to provide most of the grazing for the enlarged herd.

"This kind of farming is so much easier than what I used to do; it's almost like doing nothing," Weaver said as he glanced over the waving grain fields. "It's paying off as much again as cotton farming, and it's not half as expensive."

He was talking about conservation farming, of course, the kind which SCS technicians in the

Broad River Soil Conservation District helped plan and apply.

Even though Weaver "paid for this farm a dozen times before buying it," he at last is tasting the fruit of ownership and good husbandry. His is not the only case of its kind in the South; it's happening all the time.

That's why I left the Weaver farm that hot day with a deep-seated hope for all those others who have not yet learned that a good way to obtain economic security is by "using the land wisely and treating it kindly."



SEEK COMMON OBJECTIVES.—Dillard B. Lasseter, administrator, Farmers Home Administration (left), and H. H. Bennett, Chief of the Soil Conservation Service, planning closer cooperation between the Soil Conservation Service and the Farmers Home Administration.

The SCS, through cooperation with local farmer-rancher soil conservation districts, has been and still is helping FHA farm ownership and adjustment borrowers develop and apply conservation plans based on land capabilities and conservation practices which result in sound conservation treatment and land use, thereby leading to loan repayment and satisfactory family living.

The FHA expressed a desire to develop further this cooperation and teamwork. Lasseter asked all State directors to encourage farm ownership and adjustment loan borrowers, and all applicants to whom they expect to make loans, to obtain SCS assistance if they do not have a current conservation plan. He also asked the State directors to include funds in loans, if necessary, for carrying out the plans.

Bennett requested all SCS regional directors and State conservationists to encourage and assist the conservation districts to help FHA borrowers in every practicable way.

PUBLIC RELATIONS.—Representatives of newspapers and banks in the Wright County (Iowa) Soil Conservation District were guests of the district commissioners at a regular monthly meeting recently. This was the first of a series of meetings in a plan to get more people interested in the work of the district.

NEBRASKA STORM PROVES VALUE OF CONSERVATION WORK

By A. E. McClymonds

ON THE night of May 9, 1950, Sam Pickerell stayed in the house on his farm 2 miles south of Unadilla, Nebr., where he has lived for the past 30 years. Old Jupiter Pluvius had upset his bucket. It was no night for man or beast to be out. The water fell in sheets.

The country knew the next morning how much water fell, for the rain caused one of the worst floods in Nebraska's history, and one of the year's worst in the United States.

The heart of this furious storm covered a relatively small area. Yet, over a score of lives were lost. The force of a sudden sweep of water down a tributary valley was enough to lift a large passenger bus from the highway near Unadilla and into the Little Nemaha River some distance away. Houses disappeared completely. Railroad lines were ripped up.

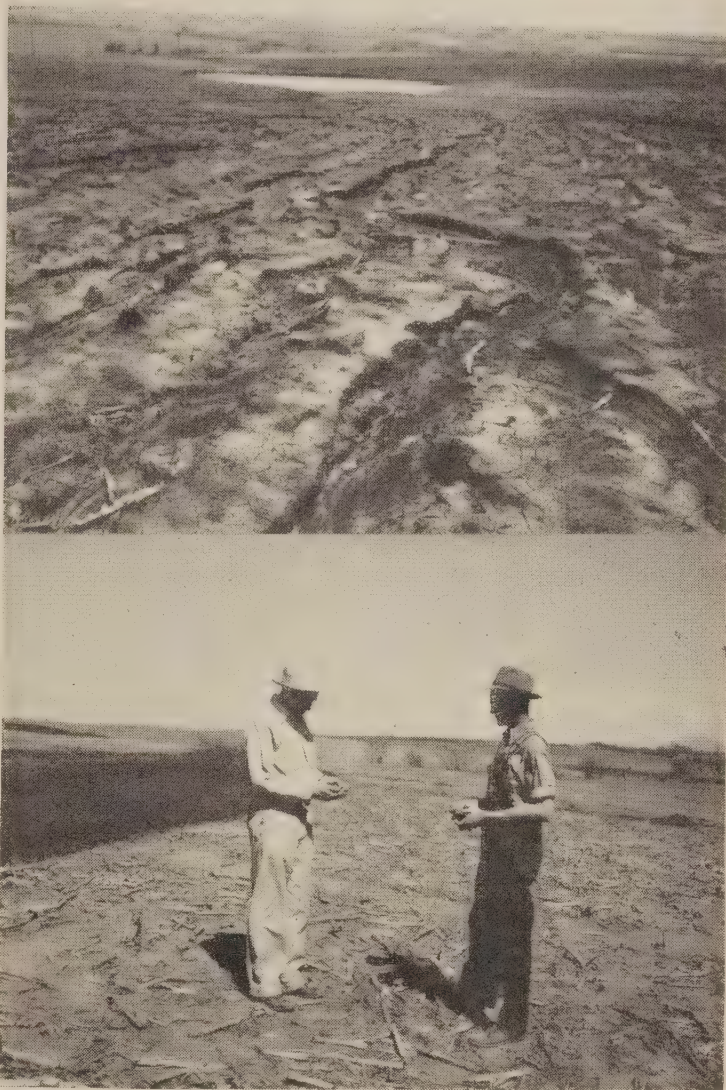
Early the next morning, when he went to look things over, Sam Pickerell smiled. He found that, aside from a little soil movement between terraces on his cornland, his farm was apparently unhurt. Contoured, terraced small grain and alfalfa, and grassed waterways, bore no evidences that soil had been lost.

More than that, no water had gone through the flood spillway of his large dam. It had been built to give him 15 acre-feet of permanent storage and 25 acre-feet for just such an emergency as this. A square, reinforced concrete drop inlet was installed to bring water down to the permanent level.

"This time," Pickerell said, "the water almost reached the spillway, but not quite. It took hours for the runoff water to get away through the drop inlet. There was no other way, since the whole 215-acre area drains to the pond."

Not only does Pickerell feel that he was not hurt, but he is certain that the way runoff from his land was controlled helped to reduce damages lower down on this small tributary watershed to the river.

NOTE.—The author is regional director, Soil Conservation Service, Lincoln 1, Nebr.



Contrasts! Lower picture, on Arnold Rinne farm, 4 miles south of Dunbar, Nebr., was taken shortly after torrential rainfall that resulted in southeastern Nebraska floods May 9 this year. Rinne cooperates with Otoe County Soil Conservation District; note that corn stalks on ground have hardly been disturbed. Nor are there other evidences of land damage. The upper picture is of a very different sort; it was taken immediately across the road from the Rinne farm. This land is not protected by conservation; note evidences of severe erosion. The pond in background contains little water; it is silted almost full.

This happened in the section where rainfall was heaviest and most violent, and where runoff water and flooding streams generally raised unmitigated hob with land and people.

A cooperator with the Otoe County Soil Conservation District, Pickerell is one of the growing

number of farmers who had developed complete soil and water conservation plans for their lands with the aid of Soil Conservation Service technicians. Their experiences are important, because they gave the Soil Conservation Service some of the needed field evidence of the effects of land treatment on the behavior of flood waters on watersheds.

The total area affected by the storm and floods in southeastern Nebraska early in May was 3,600 square miles in extent. Plotting the storm on a map revealed that it centered in a space of not over five townships that encompassed the ridges, or divides, between the headwaters of Salt Creek, flowing north to the Platte River; Weeping Water Creek and Little Nemaha River, flowing east and southeast to the Missouri River; and Indian Creek, flowing southwest to the Big Blue River.

Within this storm center, rainfall was reported to be 10 inches or more. That is at the rate of nearly 600,000 gallons per average city block. It fell in a few hours. Around this center was a band in which the reported rainfall was 6 to 10 inches. In other parts of the storm area, rainfall ranged from less than 2 inches up to 6 inches. Cornland was loose, being in various stages of seed-bed preparation, and oatfields had little protection because the crop was late.

Surveys made by the Soil Conservation Service brought a report that losses from the flood amounted to \$53,041,322. Of this, sheet erosion on the upland accounted for 88 percent. Gully development and harmful deposition on the upland amounted to slightly over 1 percent; bank erosion, scour, harmful deposition and swamping on bottom lands, 2 percent; damage to agricultural establishments, 3 percent; damage to county roads and bridges, 6 percent. Nine-tenths of the damage to agricultural establishments occurred on the flood plains.

These damages do not include damages to municipal, urban, or State property, Federal and State highways, railroads and communications services, which were inventoried by the Corps of Army Engineers.

The Soil Conservation Service found that while wheat was well up and offered much resistance to erosion, some wheatfields on which conservation was not practiced lost as much as 1 inch of soil or about 135 tons per acre, and oatfields lost as much as 2 inches of soil. Cornfields not protected by conservation measures suffered most heavily, in-

stances being found where the losses were 4 inches or more—at the rate of over 530 tons of soil per acre.

These figures assume greater importance when the type of agriculture and terrain are considered. The land is gently rolling—at places quite steeply rolling. Three-fourths of it is in cultivation, only one-fourth in grass. Sixty percent of the cropland is devoted to corn, 25 percent to wheat, and 10 percent to oats. The rest of the cropland is in minor crops.

Few farmers in the storm area escaped damage, but those with conservation measures applied were hurt less than those without conservation. Further, it was observed, damage to conservation farms varied according to the extent to which the complete soil and water conservation plan had been applied to the land.

These surveys unmistakably showed that conservation paid the farmer well in this time of emergency. They compared the flood damage on land not protected by conservation measures with those on land under good conservation plans. On unprotected land it was found that productivity was reduced by soil losses from \$1.62 to \$7.21 a year on the average in the major crops—corn, wheat, and oats—compared with the conservation farms. These losses will go on from year to year until measures to restore productivity are undertaken.

The wide spread in the benefits of conservation in reducing upland flood damages is because of different intensities of rainfall. The lower figure is applicable in the 0- to 2-inch rainfall zone. The higher figure applies in the zone where rainfall was 6 inches or more. In between, in the 2- to 6-inch rainfall zone, the calculation is \$5.91 an acre. The dollar value of the reduction in flood damages resulting from adequate soil conservation measures rose sharply as the intensity of rainfall increased.

Savings were to be found all through the area. One good example is the Swain Nielson farm near Weeping Water, which is in the Cass County Soil Conservation District. Waterways were established and terraces newly built on the 10- to 12-percent slope. After the storm Nielson found that the terraces had trapped quite a bit of silt, but there was no evidence of severe erosion on the fields, and little silt was deposited in the waterways. He only had to look at land around him that was not protected to appreciate the saving.

Harold Thomassen, in the same area and cooperating with the same soil conservation district,



While the runoff from torrential rains was ripping away at farms and sending southeast Nebraska streams on a rampage, Sam Pickerell, 2 miles south of Unadilla, rode through the storm with little harm to his land. More than that, he helped reduce the flood of water in the small tributary below his place because he had a dam that was designed with some capacity for the temporary storage of flood water. A cooperator with the Otoe County Soil Conservation District, he has a complete conservation plan on his land. This picture shows the dam, pond, upper end of drop inlet, and part of the 215-acre watershed draining to the dam. The dam provides permanent storage capacity of 15 acre-feet and a temporary flood storage capacity of 25 acre-feet, with the drop inlet governing the flow of water from the pond. During the storm, the water in the pond almost reached the emergency spillway.

All of the excess water was disposed of by way of the drop inlet.

"had the book tossed at him." He had built the planned terraces on half of his 120-acre farm, but had not gotten around to building the others. After the storm he found the untterraced land "a mess"—gullied and soil taken almost as deep as the land had been tilled. The bottom land along the little stream through his farm was under deep deposits of silt from upstream. But although his terraces had trapped several inches of silt, the field where they were located was hurt little. "The silt in the terraces is right up there where I can plow it back out, not in somebody else's creek bottom," he remarked.

The quoted figures on the savings through conservation do not tell the whole story, since they deal only with the conservation of land in cultivation. The farms of cooperators with soil conservation districts, which embrace the whole flood

area, have done considerable seeding of grass in getting their conservation plans well established. A goodly part of the grass protects waterways, part is in crop rotation, and much of it is seeded on land not suited for cultivation.

Little, if any, damage was done by upland-flood runoff on properly managed grassland. Instead, good stands of grass served to retard the flow of runoff. The land that is not suited for cultivation is the most erosive when it is in crops. Evidence on all sides pointed to the probability that this land now in grass would have been seriously damaged if its use had not been changed. In fact, it appears likely that restoration to grass of all such land in the storm area would have done more to reduce sedimentation damage than any other conservation measure.

Some of these conservation farmers, particu-

larly livestock feeders, have put most of their land to grass—even some that is first-class cropland. On these farms one could see the effectiveness of grass in controlling water and siltation.

Sterling Ingwerson, near Plattsmouth, a cooperator with the Cass County Soil Conservation District, is one of them. His land is terraced and grass waterways were built. Now he has nine-tenths of his farm in grass. Something over 8 inches of rain fell in that area the night of the big storm.

"I went over the farm the next forenoon," Ingwerson said. "The terraces were still half full of water. The water was clean and flowing slowly into the waterways. We didn't have any damage, except a little bank cutting on the creek that flows through the farm. That water came from upstream."

No one knows, of course, how much of that rain was kept on the Ingwerson farm. In view of what Ingwerson found, however, it seems certain that a large part of the water was not permitted to escape.

Alvin Ross, near Syracuse, cooperator with the Otoe County Soil Conservation District, hasn't gone so far as Ingwerson in changing land use. He has grass in his crop rotation and well-established grass waterways, but his other grass seeding is land found not suited for cultivation. Generally, the other land is in cultivation. Other practices were established as needed, of course, such as terraces, contour farming, proper rotation of crops, and well-managed uses of the grassland.

There is one 40-acre watershed on this farm that drains to a dam built in what was a gully or dry stream course. Grass surrounds the pond and extends back some distance from it. A metal tube a little below the level of the flood spillway usually disposes of the excess water, letting it down into the small stream bed below. There is no other way for the water to go, except to the pond.

"We had a 4-inch rain a couple of nights before the big rain, and then an 8-inch rain the night of May 9. I didn't know what I'd find the next morning," Ross said.

"Well, the conservation measures must have controlled the runoff pretty well. You could see where a little water ran through the flood spillway, all right. Not much, though. The tube took care of nearly all of it.

"There was a little silt in the terrace channels

on the cultivated land, but it came from only about the lower 20 feet of each area between terraces. My whirlwind terracer will toss the soil back up-slope that far, so I figure the land will be about the same as it was before the storm. I couldn't find any indication of silt in the waterways or around the pond."

Only one man was found who watched how water acted on conservation-farmed land. He is Lawrence Liebers, who is in partnership with his father, O. H. Liebers, and his brother, Otto, on a dairy farm just south of Lincoln.

Their bottom land was damaged by the raging waters in Salt Creek, but they could not help that. That water came from upstream. But on their upland, where they had control, the story was different. They are cooperating with the Lancaster Soil Conservation District.

Lawrence, standing in one of the farm buildings, watched one of their fields across the road during the storm. It was land that was pretty badly run-down when they bought it, Lawrence said, but after being terraced and contour farmed, and with crop residues and other organic matter being put into it, it was considerably improved. Even so, the oats stand was poor at the time.

"We had about 4 inches of rain in a short time," Lawrence explained. "You could see the terraces fill. Some even spilled over a little. But instead of going right down hill, the water had to move slowly across the slope to the waterway, which you can see has a heavy grass cover. The waterway looked like a lake, but it handled the water in good shape. I haven't noticed evidence of silting in the waterway and the field wasn't hurt to amount to anything. Oh, there is a little silt in the terrace channels but that'll be easy to take care of."

The story was the same wherever one went throughout the flood area. There was too much water to have prevented a flood, but where there was good conservation on the land, mighty little soil left the farm. And where dams were correctly designed for their drainages, provided with correctly designed tubes and spillways, and with drainages protected properly with conservation measures, they functioned to control the escape of water in an orderly manner after it had left the fields. Nor were they subject to reduction of capacity through silting.

There are no reliable figures on how much water ran off these farms. Due to the violence of the storm, however, even the land most completely

protected by conservation must have lost the major part of the rainfall. So, it was a prodigious task that these conservation measures performed. If the rain was fairly uniform on the farm, water that fell on the drainage to Sam Pickerell's dam amounted to about 170 acre-feet, but his emergency flood storage was only 25 acre-feet. The conservation plan on the land controlled the movement of the runoff water so that it was disposed of through the drop inlet over a period of days. On Sterling Ingwerson's land, the rainfall was about two-thirds of an acre-foot of water per acre, yet the next forenoon the terraces were still half full and the water was moving off slowly. And on the drainage to Alvin Ross' pond, about 25 acre-feet of water fell only a couple of days after another storm half as heavy. The pond was full, and had no emergency flood storage, yet the movement of water was controlled so that all but a small part was disposed of through the 30-inch tube.

Those are the hallmarks of good land treatment and in them is the hope for holding flood losses on the upland to the minimum and protecting the downstream structures from destruction by silt and other debris.

DRAINAGE IN REVERSE

By M. S. McMURTREY

ALL IS not drainage in South Dakota! Water is used there to *create* wildlife habitats. A good example is the farm of Leon LeClaire, a cooperator with the Beadle County Soil Conservation District. There is a slough on his farm that covers 70 acres when it is full. He now diverts water to the area to give stability and insurance against the loss of both muskrats and ducklings during dry years.

"The slough was dry when I bought the place in 1943," LeClaire said. "In 1946 we moved onto the farm, requested assistance from the soil conservation district, and started to develop the farm

conservation plan with the aid of Soil Conservation Service technicians.

"At this time water was in the slough, and the bulrushes, cattails, and other aquatic plants had come back enough to make the area attractive for muskrats and waterfowl. During the years the trapping season has been open in South Dakota, the take of pelts has averaged over \$200 annually.

"The only fly in the ointment is that in the past the slough has become dry at times, forcing the muskrats to leave the area. When it filled up again, it took time for the 'rats to return."

When a survey showed that the bed of a nearby intermittent creek had a higher elevation than the slough, there was no question of the best land use for this area by either LeClaire or the SCS technician who helped him draw up the conservation plan for the farm. A cut was made through the low divide "hogback" and a galvanized culvert 24 inches in diameter was installed leading from the stream to the slough. A gate was put in the culvert to regulate the flow of water in the slough. A permanent marsh can thus be maintained by stabilizing the water level.

A dike was constructed at the old outlet of the slough to raise the water level 2 to 3 feet. This makes the deepest parts 5 feet deep. The extra depth is for insurance against long, dry periods and also to furnish some free water below the ice through the winter months, making rootstocks and tubers available to muskrats when other food is scarce. The dike will force the excess water, if any, out over a natural grass-covered spillway.

Another source of water in the early spring is a low place in a nearby field that is being drained into the slough. This 3-acre area dries up too early in the season to be of much value to wildlife, but not early enough to avoid lowering the farm income by interfering with farming operations at planting time.

With installations to control the water level in the slough, LeClaire is looking forward to a high, sustained annual yield of muskrat pelts. He even hopes to improve the 'rats by the introduction of the dark-furred strain.

Besides improving the habitat for muskrats, LeClaire pointed out that every year when water was available a large number of ducks were produced on the marsh. With permanent water, this 70-acre marsh will be a valuable migratory-waterfowl nesting area.

NOTE.—The author is regional biologist, Soil Conservation Service, Lincoln, Nebr.



This is the condition that prevailed in May 1939. No wonder that railroad officials considered pulling up these tracks in favor of another right-of-way!

STILLING THE DUNES

By HUGH H. BENNETT

IN 1940 I visited the John Martin Dam, then in process of construction by Army Engineers, across the Arkansas River in southeastern Colorado. I had gone there to examine the sand-dune stabilization work being carried on under the supervision of Clifton L. Etter of the Soil Conservation Service in cooperation with the Army Engineers, who were building the dam.

Construction operations had bared to wind action much sandy ground along the Santa Fe Railroad. The tracks had been moved a short distance south of the prospective reservoir. There were 1,200 acres of critically unstable sand along the rail line, including dunes on the march. And it was this area the Service had been asked to help stabilize.

One inexperienced with wind-drifting sand in a dry climate might have suggested, offhand: "Plow up the stuff and seed it to grass or plant it to trees."

Sounds like good advice, but it isn't—not for blowing sand in southeastern Colorado. When it comes to calming deep, loose, dry sand bared of its protective cover of vegetation and already blowing with every breath of wind, plowing only intensifies the movement. Seed it to grass or plant it to trees, and in a little while seed and trees are blown out.

When I was there first, I was shown how the loose sand covered with petroleum was again on the move a few days after application. That method, while it may help in calming ocean waves, is of little value for subduing the restless sands of

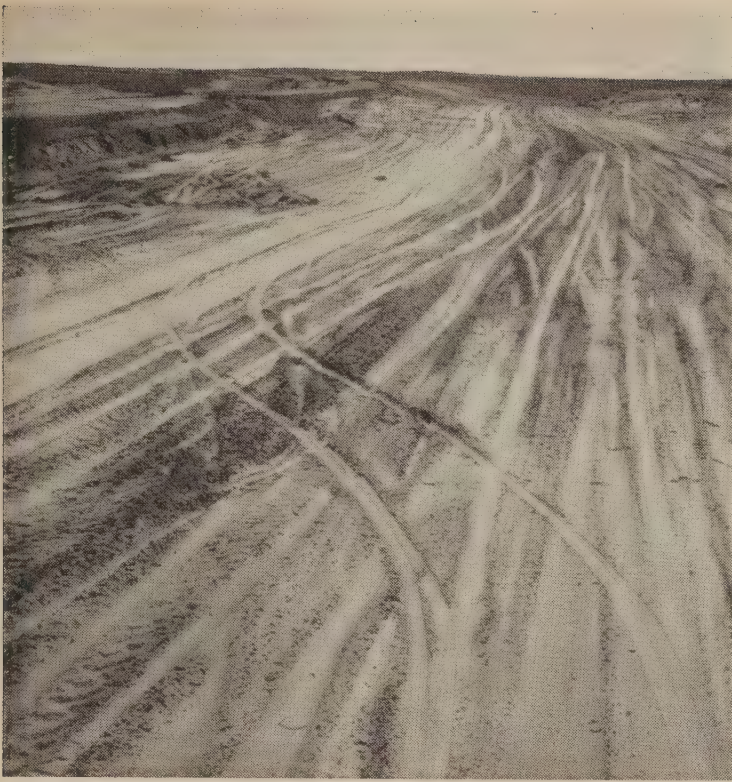
a subhumid climate. Various other measures had been tried. Everything had failed but one thing. The one thing that had worked was a combination of drilling in adaptable grass seed and immediately covering the ground with a mulch of wheat straw.

At this point the reader may be wondering why the Soil Conservation Service was called in on the job of calming the sands way out there in the treeless plains. Here's why:

The United States Government was building the dam, but first it had to move a railroad. Everybody wanted the dam so that floods could be abated and some of the valuable water that had run to waste could be held back for better irrigation of the croplands. If something wasn't done to calm the dunes, miles of the Santa Fe tracks would have to be relocated when the dam was completed and the gates closed to avoid submergence. Moving them to the north side would involve the building of two bridges, one to get over to the north side and another to get back to the south side farther upstream. It would involve also the purchase of some 17 miles of right-of-way through valuable irrigated farm land on the north side, as well as much costly track construction.

All these bills would have to be footed by the Federal Government—the taxpayers. They added up to a sizeable sum.

The Santa Fe Railroad was not responsible for the situation, and it was fortunate that it wasn't unduly stubborn about what to do. Officials studying the situation on the ground had agreed that if the tricky sands could be completely stabilized, they would be willing to move the track to the south through the dune area. One of them had seen some of the sand-dune stabilization work which had been successfully carried out by technicians of the Soil Conservation Service during the height of the dust storms, right in the heart of the old Dust Bowl, near Dalhart in the Texas Panhandle. This individual may even have seen the famed crow's nest, which in the dry, dusty thirties had been built of pieces of wire because there was no plant material for the construction of a raven's home. Also, he may have heard of the success the Service was having at the time in calming a 20-mile stretch of costly moving sand dunes just south of where the Columbia River enters the Pacific Ocean, or of another outstanding success in stabilizing drifting sand in west-central Michigan.



Borrow-pit areas adjacent to fill before stabilization.

So, the Soil Conservation Service was called in. One technician—Cliff Etter—was to do the job. When I was there the first time, he already had made some convincing progress. He had gone far enough to feel assured the job could be done, and on time. I was driven over the few negotiable trails through the dunes, but for the most part it was necessary to walk. The car wouldn't roll through the loose sand except where the wheel tracks were padded with yucca leaves or straw.

The situation looked tough to me. I asked Etter, "Think you can do it?"

"Sure," he said with comforting assurance.

"Anything I can do to help you?"

"Yes."

"What?"

"See that patch of sagebrush over there?"

"Yes, what about it?"



Full speed ahead! The sand no longer drifts. Vegetation has command of the situation on the south side of the Arkansas River at the John Martin Dam.



Stabilized borrow pit with high growth of sand reedgrass along Santa Fe line. Bennett's expression seems to challenge the wind to do its worst.

"There are some clumps of big bluestem scattered through the sage. Dig up some of 'em and plant 'em over on this bare sand here."

I did. And 10 years later, on this last trip in August 1950, I asked Etter how my planting of big bluestem had turned out. "Fine," he replied, "I'll show you."

The grass was 6 feet high and plenty thick.

On this last trip I was driven by car at a good gait all through the subdued dunes, although the grass was too thick in some places to make much progress.

Some of the old bare dunes outside the stabilized area were still blowing, but they had not encroached on the grass-protected area, now a veritable oasis in the desert.

The principal grasses used were little and big bluestem, sand reedgrass, blue grama, switchgrass, sand dropseed, and sand lovegrass. Every one of these had succeeded and, together with a sprinkling of wild sunflower, had tied down the sand so well that even the Chief and the Superchief trains go through the area like rockets.

In a few places trees had been set out after the grasses had taken hold. Most of them had survived, but some, especially the conifers, had not made much progress because of depredations by rabbits. Russian olives apparently had done better than the other trees. The cottonwoods had



Bent County scene, 1940. That's Hugh Bennett, with foot suspended in midair, at crest of 30-foot dune.

survived, but only about a fourth of them had made good growth.

A cloud blotted out the sun as we came into the area in mid-August 1950. The temperature was delightfully pleasant. There was a drizzle of rain which later changed to a downpour that extended to a large area of parched land to the east. Hundreds of mourning doves rose from the ground as we drove through the grass. They made a merry whistling sound with the fluttering of their wings. Other birds were present, providing a variety of cheerful calls. In one place where the cottonwoods were thickest there was a lively chattering suggestive of a gathering of parakeets along the border of a Central American jungle at sundown. Deer and antelope were reported as spending considerable time in the area.

Truly, a very live oasis had replaced what had been a dreary patch of worthless sand.

When I saw this treated land, I knew at once that man had again won his combat with the wind. Such work is tough always; it has to be done scientifically, according to the kind and need of the land. If not done this way—and very few know how to do it—failure is preordained. This job along the Arkansas had been carried out scientifically, step by step, with every plant and every practice fitted into its particular niche in the planned, coordinated pattern, according to basic procedure of the Soil Conservation Service.

I found great satisfaction in this completed task, as I had found in the highly successful sand-dune

work at Dalhart, Tex., at Astoria, Wash., and in Sullivan's Sahara in Michigan.

And again I can say, and do say, no better conservation work has been done, or can be done, anywhere. I have seen the stilled sands of southern France and the restless Saharan sands in North Africa, but what we have done here in America gives me renewed faith in our capacity to cope with any erosion problem.

Now let's look at the cost of the job and while doing so let's keep in mind what we occasionally hear from the uninformed: "Soil conservation work today is too refined. It's impractical. It will never get the job done."

For shame, is my answer to all such nonsense. People should inform themselves—get the facts. Such utterances are not only completely out of focus with scientific principles and procedures as well as with the truth, but they could encourage despondency on the part of some segments of the public. Let's get the thinking cleared up.

Here is the truth: The Soil Conservation Service did this sand-stilling job along the Arkansas, as requested, even more effectively than was expected. It was not known at the beginning that some of the grasses, particularly sand reedgrass, would lay down a broad mat of dead material some 3 inches thick and 15 or 20 feet across—as perfect a sand-control measure as the mulch of wheat straw that was used in getting the grass started.

As to cost: By not having to move the tracks of



Bent County scene, 1950. Again, it's Hugh Bennett with foot in air at same crest. With him is C. L. Etter, who supervised the stabilization work. The slope is now heavily grassed.

the Santa Fe north through the valuable irrigated land with all the accompanying costs, around \$2,500,000 have been saved, according to my estimate.

And why should the Soil Conservation Service spend its funds to help a railroad get such a job done, someone might ask. Well, in the first place the Soil Conservation Service did not spend its funds on the job, although I can see no earthly reason why it should not have done so, if necessary, since the dam that was constructed has served to reduce flood heights and to conserve water for irrigation in an important agricultural area. No part

of the direct cost was paid by the Soil Conservation Service, either for materials or for the salary of the one-man force.

The job could not have been done any other way. I am pretty sure nobody else had the know-how. The ability to cope successfully with difficult and unusual land problems has come to the Soil Conservation Service as a result of intensive scientific research and long experience. The victory on the Arkansas, like other triumphs of soil stabilization, pleases me immensely. I liked what I saw out there and I am making this report as a piece of good news from the conservation front.

UNIQUE CHURCH SERVICE.—Worshippers entering the Quitman (Ga.) Methodist Church September 10 were surprised at the unusual altar decorations. But when they turned to their bulletins, they found that the Reverend L. D. Shippey, pastor, planned a service on the common trinity of life—God, the earth, and man.

Rev. Mr. Shippey planned the unique decorations and service in response to an appeal to help promote Soil Conservation Week.

In brass urns back of the pulpit were fresh green pines. The table on the altar was centered with a large evergreen circle, a gold cross, an open Bible, a hoe, and plumb-line. The table was banked with ears of corn, tobacco leaves, and other Brooks County products.

These symbols had a background of religious significance. The circle of evergreens was suggestive of continuous renewal of life on earth and of its eternal promises. The triangle suggested the common trinity of life—God, the earth, and man. The hoe was the symbol of work, the plumb-line a symbol of God's justice, the Bible

a symbol of God in history, and the cross a symbol of eternal life. The farm products typified "God giveth the increase."

This was one service where everyone had a souvenir to take home. Around the chancel rail were several hundred tall paper cups. The pastor did not explain the meaning of these until announcing the last hymn. He wasn't serving punch, he explained. Each cup was filled with soil from the church grounds. Two of the ladies of the church had planted a bulb in each cup. They suggested that each person present take a cup home, keep it slightly moist, and when the bulb blooms, cut it and take it to some sick person, a loved one, or a shut-in.

SOMETHING NEW.—Tom Powell, district conservationist, Shenandoah, Iowa, reports the first posthumous conservation farm plan. The plan will be carried out by a farm-management company and no changes can be made without approval of the soil conservation district.

QUAIL POPULATION BOOMS BECAUSE THERE IS WATER TO DRINK

By WILLIAM L. SOUTHWORTH

THE NEXT time you visit San Diego County, Calif., look up Billy Bevan and ask him about "quail guzzlers." You will meet a dynamic conservationist and hear a fascinating story.

If Billy Bevan is not at home on his avocado ranch just west of Escondido, or if he's not at the office of the Escondido Soil Conservation District—he's a director of the district—you'll probably have a long wait because the chances will be good that he's out inspecting quail guzzlers or taking another census of the district's booming wildlife population.

What is a quail guzzler? It's an ingenious device that makes it possible for quail and other small birds and animals to survive and flourish in areas where they would otherwise die of thirst. In many parts of southern California, water during the hot, dry summer months is the key to wildlife. With water and good management, you can have game birds. Without it, you can't.

The directors of the Escondido Soil Conservation District discovered this some years ago. Under Billy Bevan's leadership, they launched a large-scale, but highly secret, program of quail-guzzler construction. Today the district is famous in southern California for its abundant quail and other game birds.

Bevan and the district directors will talk freely about quail guzzlers. They will cite figures showing how the guzzlers have increased the quail population many times over. They'll tell you how many guzzlers have been installed in the district and even give you blueprints so you can build your own. But they won't tell you where a single guzzler is located. Nor will they take you out and show you one. The location of quail guzzlers is top-secret information for the simple reason that the directors have learned from bitter experience that there are still a few unsportsmanlike hunters who would like nothing better than to conceal themselves near a guzzler and "ground sluice" their limit in a few minutes.

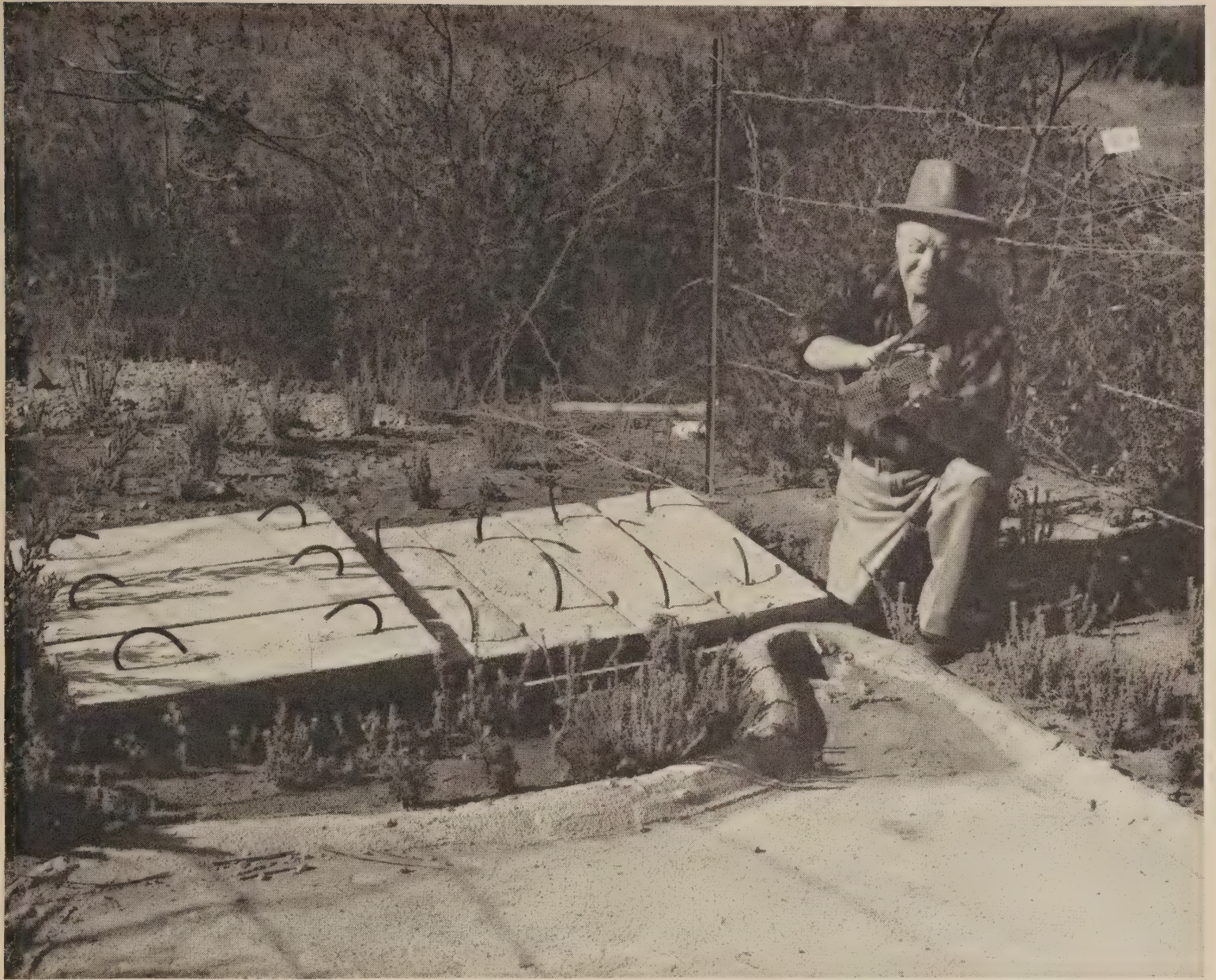
The story of quail guzzlers in the Escondido Soil Conservation District is largely the story of Billy Bevan's interest in wildlife. Bevan is probably more famous as a character actor in the movies than as a conservationist. He began his acting career in the old days of silent pictures as one of the "Keystone Cops" and is one of the few old-timers still playing character roles in the modern movies.

Some years ago Bevan bought a small avocado ranch near Escondido in San Diego County and went into semiretirement from motion pictures. One of the first things he noticed in the Escondido area was the absence of wildlife. He was at a loss to understand why. Thousands of acres of undeveloped land looked to him like ideal habitat for quail. Elderberry, wild buckwheat, filaree, bur-clover, deer vetch, and brome, all high on preferred quail menus, abounded. Dense thickets of chaparral, chamise, lilac, and scrub oak created good cover and near-perfect nesting conditions. What was wrong?

Billy Bevan took his puzzler to the California Fish and Game Commission. They told him the answer quickly—no water during the hot, dry summers when streams stop flowing and ponds and reservoirs dry up. They also told him there was a way to solve the dilemma. Ben Glading, chief of the commission's bureau of game management, had encountered the same problem as Bevan and had worked out an ingenious solution. He designed a sunken concrete tank with a small apron to catch winter rainfall. The tank was covered and provided with a small opening where quail and other game birds could enter and walk down a miniature ramp to the water. A punster with a flair for alliteration gave his device the name, "Glading's Gallinaceous Guzzler." (Gallinaceous for "Galiformes," which includes members of the quail, grouse, partridge, and pheasant families.)

When Bevan returned, he laid his findings before the board of directors of the Escondido Soil Conservation District. He urged a guzzler cam-

NOTE.—The author is with the Soil Conservation Service, Portland, Oreg.



Coarse wire screen prevents leaves and twigs from clogging inlet. District directors make occasional inspections to clean screens and check water levels. Ranchers with guzzlers on property also help. Small depression ahead of inlet serves as silt trap. Billy Bevan, attending to screen, will remove collected silt before he leaves.

paign. The board agreed to back Bevan and told him to draw plans. Billy cornered Lee Woolsey, the district's technician from the Soil Conservation Service, and the two began working up specifications.

They estimated that a tank holding about 500 gallons of water would carry quail through from one rainy season to the next. By a simple calculation, they found that an apron approximately 10 feet square would catch enough rainfall to fill the tank. Winter rainfall in the Escondido area averages around 16 inches annually. To hold evaporation loss to a minimum, they decided to bury the tank and keep it covered at all times. Their specifications also included a settling basin so that silt would not muddy the drinking water.

They included a screen at the inlet to prevent clogging by leaves and other debris. The final touch was to provide an easy way for quail to get at the water but a way that would prevent coyotes, cats, and other predators, from using the guzzler.

The precaution against predators was vital, according to Bevan. He says, "Quail won't go near a watering hole if it's used by coyotes or half-wild cats. Young quail are no bigger than a walnut when they want their first drink. But they'll die of thirst before they'll go near water where there's danger." He also pointed out that if large animals could get water from the guzzler, they would drink it all and not leave any for the quail.

Bevan and Woolsey used Glading's original idea for solving the problem of access to the water.

They designed a sloping ramp which led down into the storage tank from a small opening, just large enough for quail to enter. As a further precaution, they added a coarse wire screen at the opening, large enough for quail to get through, but too small for cats and other quail-hungry animals.

In complete secrecy, Bevan and Woolsey took their plans and enough sand, gravel, and cement to a remote and little-frequented area in the district. There they built the first quail guzzler in the district. True to their expectations, it filled with the first rain and has remained filled with water ever since. It was only a matter of weeks until the value of the guzzler was apparent; approaches to the watering ramp were littered with the tell-tale tracks of quail. During a single count, 25 birds were seen to step up and quench their thirst.

Directors of the Escondido Soil Conservation District are thoroughly sold on quail guzzlers. Within the past few years, the district has been instrumental in getting more than 40 guzzlers built in the county. Many of these it has built itself. Others have been constructed by the Escondido Fish and Game Association and many more by the State Fish and Game Commission.

The procedure for getting guzzlers installed is simple now, according to Bevan. "Whenever a grower in our district applies to the board of directors for conservation help we ask him about quail on his place. The grower usually says, 'There are a few quail, but they don't have any water.' We tell him we'll fix that with a guzzler. We usually do if he's the right kind of fellow."

The directors of the Escondido district place a great deal of emphasis on the term "right kind of fellow." They insist first of all that anyone who has a guzzler on his place must keep the fact to himself. From bitter experience the directors have learned that not all hunters necessarily are conservationists. True sportsmen, of course, are welcome to hunt in the Escondido area during open seasons, but none of the directors wants a return to conditions of a few years back when quail were well on the way to becoming extinct.

Once the district decides that a property owner will cooperate and that a guzzler will be worth while, it will arrange to have one installed. At first, the local district paid all bills. Later the Escondido Fish and Game Association helped. As the program boomed, however, the financial bur-

den became heavy—costs ranged up to \$80 per installation. The district and the sportsmen's association asked the San Diego County Board of Supervisors to take over the job of financing. The board was willing, but it, too, was short on funds.

Billy Bevan had a quick solution for that. He suggested that part of the fines collected for violation of hunting and fishing laws be used to finance the construction of guzzlers. The County Board of Supervisors gave it quick approval. Bevan thinks the arrangement is a shining example of the right way to administer justice. With a chuckle, he says, "When the warden brings in a game violator, we erect a monument to him—a new guzzler. If those fellows want to shoot our quail out of season, we arrange for them to buy our birds a drink."

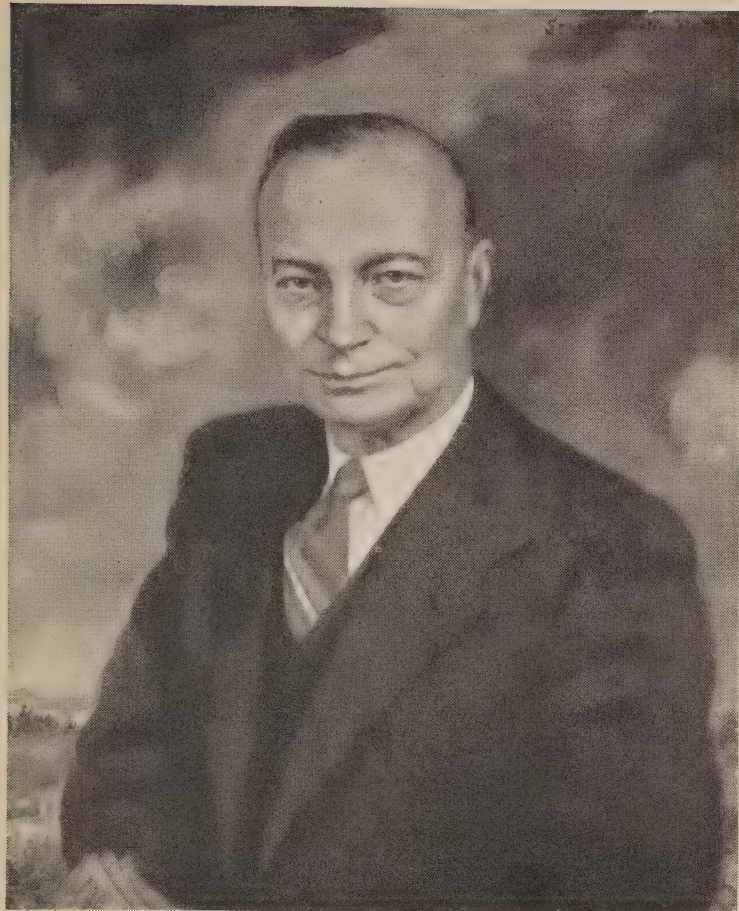
Bevan also likes to point out that the present method of financing guzzlers doesn't cost the taxpayers of San Diego County anything in added taxes. The only maintenance required is an occasional inspection to clean out silt screens and check for possible breakage by livestock. The district directors and property owners on whose land the guzzlers are located look after maintenance in the normal course of their work.

Few people encountering one of the ingenious watering devices in the rough, brushy hills surrounding Escondido would guess its purpose. Many of the older installations are now almost completely hidden in a tangle of scrub oak, chamise, and other native cover. I stood with Billy Bevan at the site of one a short time ago, and he said, "I'll wager there are a thousand quail within a quarter-mile radius of where we stand. Listen to 'em talk! This is wonderful quail country—if you have guzzlers."

MEETING A FISH SHORTAGE.—With a shortage of fish for stocking farm ponds indicated at some Federal and State hatcheries, because of inroads made by diseases, Nicholas County, in the Elk (W. Va.) Soil Conservation District, is trying something new. John Curry, county agent, has a farm pond that he watches very carefully.

Last spring when the bass nests came off, SCS technicians constructed a small pond about 5' x 10' x 3' and installed piping to bring in the right kind of water. About 2,000 bass were taken from Curry's pond and put in this holding pond. As new ponds are completed in the county, fish are removed for stocking.

A slightly larger pond on the Walter Legg farm has been used 2 years in the same way to hold bluegills. If the new bass deal works well, SCS and wildlife technicians say it can be expanded as one answer to the problem of quickly stocking newly constructed farm ponds.



Portrait of the late Edgar Clifton McArthur
by Grace Annette DuPré.

PORTRAIT OF A PIONEER

A PORTRAIT of the late E. C. McArthur, first president of the National Association of Soil Conservation Districts, was presented to Clemson College by the South Carolina Association of Soil Conservation Districts and unveiled with appropriate ceremonies in the College Chapel on August 17.

Special guests at the ceremony included Clay H. Stackhouse, of Wakeman, Ohio, vice president of the National Association; Mrs. Ellen Cobb, former executive secretary; Grace Annette DuPré, New York artist who painted the portrait, and T. L. Gaston, assistant to the Chief of the Soil Conservation Service, who was the principal speaker for the occasion.

Joe B. Douthit, Jr., president of the South Carolina Association of Soil Conservation District Supervisors, who presided, presented the portrait, which was unveiled by Bille Joe McArthur, grandson of the late Mr. McArthur.

President R. F. Poole, of Clemson College, accepted it as "the portrait of a fearless leader and searcher for truth." He said it would be hung

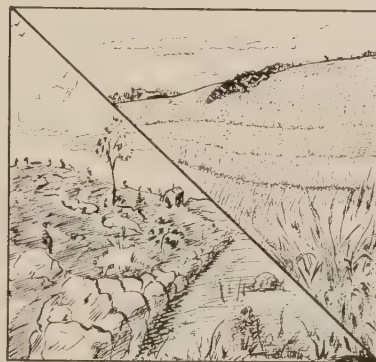
somewhere in the college where it would serve as an inspiration to future generations as the portrait of "a great teacher and a great missionary."

Gaston pointed out that McArthur had served as one of the first supervisors of the Broad River Soil Conservation District in South Carolina, and had promoted the organization of the South Carolina Association and later the National Association of Soil Conservation Districts.

McArthur's code, he said, could be expressed by some of the phrases he frequently used, such as "Where there is a need, there is an opportunity and a great responsibility," and "Plan your work and work your plan." He said McArthur also liked the quotation from Shakespeare:

"This above all, to thine own self be true, and it must follow as the night, the day, thou canst not then be false to any man."

Telegrams were received from representatives of a number of groups during the ceremony, including Waters Davis, Jr., president of the National Association of Soil Conservation Districts, and area vice presidents, meeting at Lincoln, Nebr., and from H. H. Bennett, Chief of the U. S. Soil Conservation Service.



FIELD-DAY DIVIDENDS.—Last August, on the first anniversary of a conservation field day held at W. Guy Smith & Son's Balsam Spa, the directors of the Saratoga (N. Y.) Soil Conservation District took inventory. They found wheat yielding more than 50 bushels an acre where almost nothing was growing in 1949, a second cutting of alfalfa where a stone wall had stood for almost 100 years, and Ladino clover and birdsfoot trefoil flourishing where only blackberries and steeplebush had previously grown. Most of this increased production was coming from land once considered too rocky and bushy to produce anything, or too poorly drained. Smith & Son will clear more land, remove more hedgerows and bury more stone walls this year. Where the wheat is growing on reclaimed land, new pasture will be seeded.

1,000 MILES BY BUS TO LEARN MONTANA'S STORY

By B. W. BRINK



Members of caravan view conservation practices from lookout tower built for purpose on Oscar Hippe farm in Sheridan County.

MONTANA is the third largest State in the Union. It is nearly 550 miles from east to west and 275 miles from north to south. It has vast areas of range and dry-farming land, vast areas of forest, much irrigation. Part of the State is in the Northern Great Plains, part in the northern Rocky Mountains.

These are not chamber of commerce statistics to advertise the State's opportunities. They are cited to explain why it is so difficult for the average person to know the State's resources and the problems involved in their conservation. The people in Montana can be separated by distance enough, and by environments different enough, to make them virtually strangers to each other.

A unique organization—The Montana Conservation Council—is working hard and successfully to bring people and their problems closer together. The council has no rules, no dues, and the people of Montana interested in the conservation of our natural resources make up the membership.

For 2 years in succession, as one activity, the council has organized and carried out a week-long self-financed Conservation Caravan by chartered

bus. That is, expenses of the caravan were paid by those on the trip or by some sponsor; there was no "angel."

In some cases soil conservation districts paid the way for one of the supervisors, so that he might gain information that would make him more valuable to the district. In others, civic clubs have seen to it that a school teacher or a farmer was included. Most riders, however, paid their own way.

Dr. Nicholas Helburn, professor of geography and geology at Montana State College, Bozeman, is the current president of the Montana Conservation Council. He succeeded Dr. Kenneth Davis, former dean of the school of forestry at the State university but now a member of the University of Michigan faculty. Mrs. Carolyn Madden of Anaconda is secretary.

The council was formed specifically for education.

One committee has the purpose of helping to get more conservation education into the schools. Pilot courses have been inaugurated at Anaconda.

The other committee is charged with organizing and conducting the caravan. Last year's caravan covered the western or mountainous part of the State and was attended by people from all parts of Montana. This year's was devoted to the eastern or Northern Great Plains portion and it, too, had people from all sections.

Dubbed "a rolling classroom" by one of the State's prominent editors, the caravans are by no means for "sightseeing" only. Between stopping points, the caravanists are addressed on conservation subjects appropriate to the area through which they travel.

Each morning the leader of the day's program boards the bus. He may be a district leader, a local farmer, or a representative of a government agency operating in the area. In any event, he is a person who has definite information to bring to the group.

After an introduction to the group, he picks up the microphone and the program gets under way. Descriptions of what is seen on the route are in-

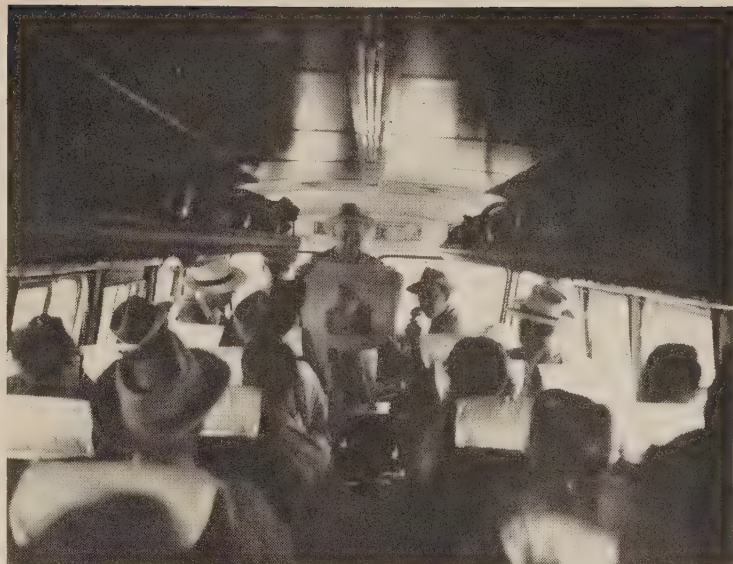
NOTE.—The author is extension soil conservationist, Soil Conservation Service, Bozeman, Mont.

termingled with discussions. Nor are the sessions cut and dried. Questions usually flow rapidly. Arguments develop. Everyone has his say.

And in the evening there usually is a meeting with local organizations where the group stops overnight. Often a banquet is provided, where there is an opportunity to spread the educational benefits still further through talks by members of the caravan.

The caravan this year is a good example. Organized under the chairmanship of Floyd Larson, of the Bureau of Land Management, Billings, it covered over 1,000 miles.

Starting at Miles City, the caravan stopped en route at the United States Range Experiment Station at Fort Keogh near Miles City, the Custer National Forest, the Medicine Lake bird refuge, the Fort Peck Indian reservation, the Nashua diversion dam, the Buffalo Rapids irrigation project developed jointly by the Bureau of Reclamation and the Soil Conservation Service under the



Rolling classroom devoted to conservation at 50 miles per hour. Topics pertain to areas through which caravan moves.

Wheeler-Case Act, and farms and ranches all along the line.

The caravanists learned about the problems of forest conservation in this part of the State, of



Caravanists learn about value of irrigated pastures as conservation practice on John Sura farm near Glendive, Mont. This is one of the farms in the Buffalo Rapids Wheeler-Case project, where the Bureau of Reclamation developed the water supply and the Soil Conservation Service developed the land for irrigation and sold the irrigated units. (Bureau of Reclamation photo.)

range conservation, of wildlife conservation, of soil and water conservation on farms along the way. They saw examples of problems met successfully.

Picnic lunches, provided by local groups, greeted the travelers daily. And at various places banquets were given for the visitors. Contacts with new people and exchanges of experiences and viewpoints were almost a constant experience.

Back home again, expressions like this were typical: "Every mile of that 1,000 was enjoyable and stimulating. . . ." "I wouldn't have missed it for the world." All agreed that a week of such close contact by teachers, employees of Federal and State agencies, farmers, and townspeople does much to promote cooperation and a common understanding.

And this, from which all walks of life gain, was, in the words printed on the cover of the caravan itinerary, "the 1950 Montana Conservation Caravan, Planned by the Montana Caravan Committee, and Carried Out by the People of Montana."

CAPABILITY MAPS GUIDE BANKERS.—Speaking in a panel discussion during Farm and Home Week at Mississippi State College, J. C. Whitehead, manager of The Fulton Bank, termed "a good credit risk" those farms which utilize soil conservation practices.

He cited a 320-acre farm in Itawamba County as an illustration, and described how using the land according to its capabilities put more money in the owner's bank account and more than doubled his credit.

"Before he put his land to its best use and gave it the treatment it needed," he said, "we could not lend him more than \$150 and expect to get it back in the fall.

"Now we can lend this man \$250 to \$500 on open note and know that we can get the money back. He is using the soil according to its capability. This farm is no exception, if the land-capability map and conservation plans are followed."

Whitehead explained that the 320-acre farm had only 36 acres suited to cultivation, yet the owner had 96 acres in row crops before a complete conservation plan was made. Yields were low—seven bales of cotton on 21 acres, 500 bushels of corn on 50 acres.

"Now this man has 10 acres in oats with lespedeza," the banker continued. "He has 12 acres in corn followed by winter legumes and producing 50 to 100 bushels per acre, and 3 acres in cotton making three to five bales."

Grazing crops now grow on most of the land once cultivated, and support 30 cattle. "And his pastures could carry more cattle," the speaker added. The farm now has 214 acres of timber protected from fire and selectively cut.

"It is easy to see why bankers should make more use of land-capability maps," Whitehead said. "You can read one of these maps and tell just what any particular farm will produce with proper management."

LIME IN THE ARID WEST

MUCH HAS been written and said on the use of lime as a soil amendment in the humid and subhumid sections of the country. It is almost impossible to find an article on fertilizers that doesn't emphasize the importance of lime, especially in production of legumes. In the humid sections of the country, no doubt the importance of lime cannot be overemphasized.

How do these recommendations for the use of lime fit in the arid and semiarid West? Here, most of the soils have a moderate to high zone of lime accumulation in the subsoil, and many of the soils are limy throughout. The percentage of lime runs as high as 25 in the surface of some soils, and exceeds 50 in the subsoil of others. Most soil scientists agree that 1 percent, which is approximately 10 tons per acre in the plow layer, is more than enough to supply all the necessary calcium for crop growth. As long as there is any free lime in the soil, the pH will be on the alkaline side. Experimental data indicate that lime in excess of 1 to 2 percent may actually be detrimental by "tying up" such plant nutrients as phosphate, iron, manganese, and boron.

Since the articles on the need for lime are carried by magazines that have a wide circulation, many farmers in the West are asking about the need for lime in their soils. Many others are actually buying lime of one type or another and applying it to their land. Some of these types are called soil conditioners and the farmers are paying very high prices for them. In one instance that has come to my attention, the price was nearly \$5 per 100 pounds.

Authors of articles on fertilizer and lime requirements of soils should realize that their recommendations are being read throughout the entire country. They should qualify their statements regarding lime needs so that the farmers in the West will not be so misled.

A line drawn from central Texas north through Oklahoma, Kansas, Nebraska, South Dakota, and North Dakota would divide roughly the soils of the United States into those needing lime east of the line, and those not needing lime west of the line.

Laboratory tests will still be necessary to determine lime requirements east of the line. Some

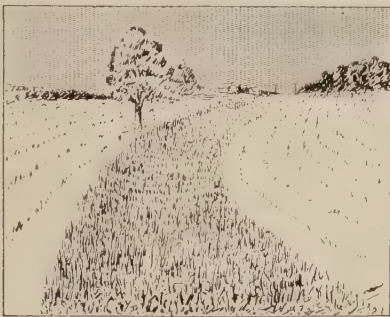
laboratory tests and field trials should be used west of the line, also, especially in areas where the average annual precipitation exceeds 20 inches or where the soils are derived from acid rocks and the precipitation exceeds 17 inches.

—BURNELL G. WEST.

MANUAL IN OTHER TONGUES.—By cable the President of Mexico recently requested 10 copies of *Manual de Conservación de Suelos*, a publication of the Soil Conservation Service. Only 9 copies could be found in the entire United States Department of Agriculture and these were air mailed to Mexico for use in a conservation congress.

Ten thousand copies were printed and distributed 2 years ago, another ten thousand last year. Twenty thousand more are now ready for distribution. Translation has been made to French and Portuguese.

NOTES FROM THE DISTRICTS



GRASS PROFITWAY.—“My 900-foot waterway is the most productive piece of land on my farm,” says Howard Young, a farmer in the Harrison County (Iowa) Soil Conservation District. He harvested 520 pounds of brome grass seed from the waterway and also used it for turning and crossing.

Howard graded the waterway in 1948 but hesitated to seed it. It looked so wide and smooth he thought he could farm right across it without any trouble. But he was willing to take advice and seeded it to brome grass. “In addition to a good cash return I’ve got a good strip for crossing—and no ditch,” he observes.

CLUB PROJECT.—On land given by Lynn L. Watson, Allegany County (N. Y.) Soil Conservation District cooperator, the Belmont Conservation Club, Inc., is establishing a model project in soil and water conservation measures influencing the production of fish and game. The project includes a 1-acre farm pond with an island nesting place for ducks. Tree and shrub plantings will demonstrate types useful in Allegany County. The area will be fenced for protection against grazing. The project is being handled through the soil conservation district with the assistance of SCS technicians. The pond, which is 14 feet deep, will be stocked with large-mouth black bass and bluegills to provide fishing for club members. The project has been financed with funds accumulated over a period of years in club activities.

CORN IN BARN LOFT.—SCS technicians in the Neuse River (N. C.) Soil Conservation District in 1947 helped E. C. Hodges work out a conservation plan that included a corn-crotalaria rotation for 10 acres of sandy Class III-B land. Recently Hodges remarked, “If you fellows hadn’t come out here I wouldn’t have enough corn on this sandy land to feed one hog. But last year I had so much I couldn’t get it all in the crib. I put some in the barn loft and sold the rest.”

FACE-LIFTING RESULTS.—Three years ago, W. E. Postlethwait’s farm in Wetzel County, W. Va., was hacked out of the brush, broomsedge and povertygrass, at a face-lifting program sponsored by the Upper Ohio Soil Conservation District. That day it was dedicated as a “tree farm.” Where nothing but broomsedge and povertygrass grew 3 years ago, alfalfa, clover, brome, orchardgrass, and timothy now thrive. In a field that was in brush higher than a man’s head 3 years ago, there was a stand of legumes and grasses almost ankle deep this year. A pasture that was reseeded 3 years ago was almost knee deep in-forage for his herd. It had been clipped once during the summer. The farmstead had been done over from top to bottom, the yard had been landscaped, and a pond had been built. A new barn is planned for early construction. Bill Postlethwait and his family have a lot more to do but, working as a team, they will reach their goal and in a few years have one of the best-looking farms in West Virginia.

ADVANTAGES OF WINTER RYE.—In September 1949, after the corn had been harvested and the land had been harrowed, John Maloney, of the White River (Vt.) Soil Conservation District, planted 22 acres of winter rye for spring grazing. During the winter he applied a good coat of manure. On May 1, 1950, Maloney turned his 40-cow dairy herd into the rye where it had 25 days of grazing. No grain feeding was necessary. During the 25 days the herd produced 22,000 pounds of milk, an average of 22 pounds per cow per day, at a time when many farmers in that area were feeding hay because of the late start their pasture had. When taken off the rye, Maloney’s herd was turned into good native pasture, and the rye field was plowed and planted to corn. A large part of the 22,000 pounds of milk was produced from the cover crop that also protected the 22 acres from erosion during the winter.

PONDS ARE POPULAR.—Six years ago, when the Elk (W. Va.) Soil Conservation District was being organized, L. A. Richardson, secretary of the board of supervisors, told technicians, “You can pass up farm ponds because we don’t need any in Nicholas County!”

If you drop in at Richardson’s farm now you’ll find that he himself has three farm ponds, two located close to his home and a smaller one. Two are stocked with fish and on one there is a boat. What’s more, Richardson has named his place “Tu-Pond Farm.”

By the end of 1950 there will be nearly 3,000 ponds, built under the district program, in West Virginia; 250 of them will be in Elk Soil Conservation District.

George Sharp, West Virginia soil conservationist, a member of the staff that started district work in Nicholas County, well remembers Richardson’s early view about farm ponds. “To hear him talk now,” he says, “I’m sure ‘L. A.’ would put a pond on every farm in the Elk district.”



Firemen of Milford Center, N. Y., demonstrate fire-protection worth of pond at Gertrude Low farm. She is a cooperator in the Otsego County Soil Conservation District.

FIRE DEPARTMENT SUGGESTIONS.—When a farm pond is being built for fire protection, there is extra insurance in this establishment when the farmer calls in representatives of his neighboring fire departments and plans with them the building of a hard-surfaced approach from the highway to a level point where the pumpers can do their most effective work.

Pumpers should be able to get within 25 feet of the deep end of the pond. If they are of the rotary or centrifugal type, they should get even closer. Most soil conservation district cooperators also find it good business to provide protection for the end of the hose that is dropped into the pond. When the right kind of cooperation is developed, fire companies make test runs to a farm to acquaint their members with the pond location and approach.

At Milford Center, N. Y., in the Otsego County Soil Conservation District, the Milford fire department, and the Mountaineers 4-H Club recently cooperated with the SCS technicians in a demonstration of the fire-protective value of farm ponds. It was held at the Gertrude Low farm, where the firemen had two lines of hose playing on the "flames," less than 2 minutes after their arrival.

KIWANIS CLUBS ACTIVE.—New England Kiwanians are giving soil conservation and agriculture an extra boost. Early in September local clubs in the district invited soil conservation district supervisors and Soil Conservation Service technicians to meetings with members, and planned field tours. The big idea, according to Daniel J. Lewis, New England chairman of the Kiwanian agriculture and conservation committee, is to enlarge membership interest in agricultural and soil conservation progress. It aims to enlist the support of other organizations by showing that soil conservation helps city people as much as farmers and that this work must go on for the good of everyone. Kiwanians are offering certificates of accomplishment to farmers, together with recognition in newspapers and magazines. Participation of young people in the soil conservation program is being encouraged by essay and 4-H contests.



VIRGINIA INNOVATION.—As another step in acquainting the public with the soil conservation district movement, district supervisors in Virginia are displaying on their automobiles a metal sign with green letters on a white background reading:

SUPERVISOR
SOIL CONSERVATION DIST.

The Executive Committee of the State Association of Soil Conservation Districts endorsed the use of the plate, which is attached with the regular license plate.

The State Soil Conservation Committee agreed to defray the cost of enough plates to provide one for each supervisor in the 22 districts in the State. The State penitentiary made the plates at a cost of 28 cents each, plus 2 cents for assembly bolts, or a total cost of 30 cents each, E. W. Mundie, extension soil conservationist, reports.

Some of the supervisors have requested an additional plate for use on pick-up truck or other vehicle.



SOIL LOSS DISTURBS CITY.—Macomb, Ill., a city of 9,000 population is in the McDonough County Soil Conservation District.

A survey of Spring Lake, Macomb's only water reservoir, showed that silt from farms had reduced its capacity so much that the lake might be inadequate by 1953 in the event of serious drought. The survey committee recommended that the city of Macomb undertake immediately a soil and water conservation program on the Spring Lake watershed in cooperation with existing conservation agencies.

It was estimated that a complete protective program on the watershed would reduce soil losses by 80 percent. Sheet erosion accounted for 97 percent of the sediment in the lake.

WHAT, NO POND?—The West Ottawa (Mich.) Soil Conservation District, which recently repaid the county board \$5,000 earned from sale of nursery stock, has lost its main nursery building and equipment in a fire. Rebuilding on a bigger and better scale has already started. In addition to nursery space, the new cement-block building will house district office and meeting room.

CONSERVATION AT LIVESTOCK SALES.—J. T. Herndon of the Herndon Stock Yard at Ehrhardt, S. C., has good reason to turn over the "mike" to Soil Conservation Service men at stock sales. According to Herndon, *a good percentage of the best cattle and hogs that go through these sales have been fed on pastures developed according to recommendations of the Service.*

The 150 to 200 farmers attending these sales engage in lively discussions as SCS technicians, M. A. Phifer, Jr., and J. C. Kay, Jr., handle the "mike." All phases of soil and water conservation are covered. And applications for help in conservation work result.

CATTLE FOLLOWED HIS TRUCK.—Farm-to-farm peddling, a common sight half a century ago, has returned, modernized and mechanized, to the Sumter County Soil Conservation District of Florida.

E. Loy Strickland, the Soil Conservation Service technician assigned to the district, is the peddler. His wares: Grasses to hold and improve land and to feed the increasing herds of cattle.

"A few years ago it occurred to me that if a farmer could see several grasses side by side he would be better able to choose those that suited his fancy and his needs," Strickland says. "In developing long-range soil and water conservation farm plans here in the district, we are now able to show farmers several grasses and legumes that we are recommending they use in a conservation program."

Three years ago Strickland prepared, at the request of the district supervisors, a grass exhibit for the Sumter County Cattle Breeders show. He planted grass in several boxes about 18 inches square.

After the cattle show, Strickland placed the grass boxes in back of his pick-up truck.

"When I first used the exhibit in the truck I spent one whole afternoon just answering questions of groups who crowded around," he says. "In making an acre-by-acre conservation plan, a farmer can study each of the grasses, compare growths, and make his choice of the ones that will fit his land."

Once Strickland almost lost his exhibit. He parked his truck in an unimproved pasture while he went with a farmer to another field. When he returned hungry cattle were munching the grass.

"The grass was so good they followed my truck until we came to the cattle gap," Strickland recalls. "This fact impressed the farmer and he is now a cooperator with the district and establishing additional pasture each year."

Strickland has another grass exhibit which he says also is proving effective. Just outside his office in the courthouse at Bushnell are more than 20 plots of grasses and legumes that can be seen by farmers.

"What you see you believe," he explains. "Besides, this method saves me lots of talking."

SUCH POPULARITY MUST BE DESERVED!—Ten thousand acres of Kentucky 31 fescue (Suiter's grass) by the fall of '52 is the goal of the Ten Thousand Acre Kentucky 31 Fescue Club of the Clay County Soil Conservation District of Mississippi. Farmers, businessmen, civic clubs,

and, in fact, just about everybody is boosting fescue. Why so much interest in fescue? It is making more and better meat and milk, fitting the land-use pattern, and adding dollars to pocketbooks.

In the fall of 1948, Joe B. Strickland, a hustling young farmer in the Pheba community, planted 10 acres to Kentucky 31 fescue and white clover on some poorly drained flatwoods land. It did better than he expected. The following spring his neighbors started asking him what he had on that old field where sedge grass had been growing for the last 15 years. The news spread around and soon groups of 4 or 5 to 60 were going to see Strickland's pasture. People came from all over Clay County district and from neighboring districts. In June 1949 when R. Y. Bailey, regional agronomist of the Soil Conservation Service, visited the farm with a group of farmers, district commissioners, and agricultural workers, Strickland told them this story:

"I half-heartedly planted 10 acres of Kentucky 31 fescue grass and white clover on some of my worst land, and now it is the best pasture on my place. I put nine cows on this grass and clover last December 10. On March 20 I took them off so I could save seed, but in 3 days milk production had dropped 5 gallons a day, so I put them back. I took the cows off again in April and the same thing happened again, so I decided it would be cheaper to let the cows eat the grass and then sell the milk and buy seed. I am sold on this grass for I have seen what it does."

As a result, about 500 acres of Kentucky 31 fescue were planted in Clay County district last fall. More farmers had good fescue pastures to show and talk about this year. More field meetings were held. Representatives of Swift and Company's milk plant at West Point held a series of night meetings and showed films on "Greener Pastures." Soil Conservation Service workers attended these meetings and told the farmers how to go about making good pastures a part of a complete soil and water conservation program. The West Point Kiwanis Club—80 strong—held a field meeting. On the farm of District Commissioner J. H. Tumlinson, Jr., they saw fescue being used in a good land-use program.

Businessmen seeing this grass and hearing farmers tell what it is doing decided more and more of it was needed in Clay County district. They joined forces with farmers and agricultural workers to speed up the job.

The Clay County Soil Conservation District Ten Thousand Acre Kentucky 31 Fescue Club was formed. Farmers become members by planting and grazing fescue according to recommendations. All other individuals, firms, or organizations become members by active support and participation in the program. Three thousand acres in '50 and ten thousand acres by '52 is the goal.

—T. D. ALLDREDGE.

SUGGESTION FOR CHRISTMAS.—A \$1 subscription to SOIL CONSERVATION Magazine is a gift repeated 12 times a year. Banks, implement companies, other business concerns find a hundred presents for farmer friends easily purchased for \$100 from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

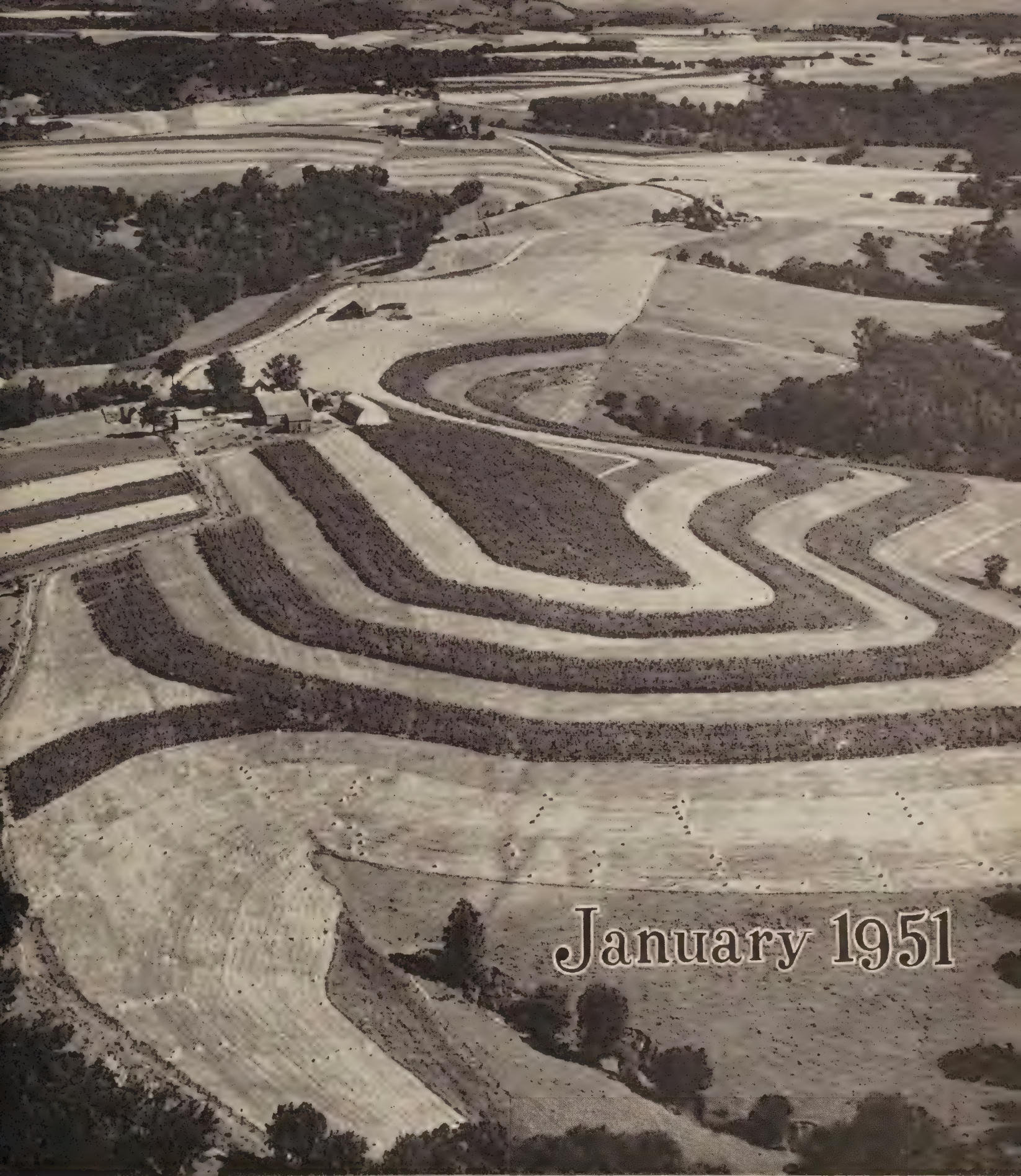


BEANS MARCH ACROSS SLOPE.—Approximately 2,500 acres of beans were planted in Ashe County, N. C., this year, but Carl Hartsog, of Creston, was probably the only farmer to plant them in strips. Most of Hartsog's farm is steeply rolling, so it is necessary for him to plant some of his crops on steep land. The field shown in the picture above is on about a 30-percent slope. Hartsog decided to plant his beans in strips after observing the small amount of soil that was lost during the 3 years he has been planting his corn in strips. Although bean production did not show any substantial increase this year, Hartsog states that he did not lose any soil, which would not have been the case if the whole field had been planted to beans.

J. T. McLaurine, SCS technician, helped Hartsog work out with the New River Soil Conservation District a system of strip cropping as part of a complete soil and water conservation program.

"Farmers in Ashe County produced around 250,000 bushels of beans in 1949," McLaurine says. "Very few of them have thought in terms of planting beans in strips, but Hartsog tells them that, regardless of the crop, it should be in strips if it's planted on rolling land."

PRISON PROPERTY SAVED.—Before it was discovered and put under control, a fire at the State Prison Farm at Thomaston, Maine, destroyed a \$75,000 dairy barn and contents. Firemen were able, however, to save other farm buildings because of a farm pond. For four straight hours at the peak of the fire they had two lines of hose pulling out of the 600,000-gallon reservoir built by SCS technicians cooperating with the Knox-Lincoln Soil Conservation District. A third line was running from a neighboring pond. Next day, from the farm pond, firemen played a stream all day on the smoking ruins.



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CHIEF, SOIL CONSERVATION SERVICE

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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

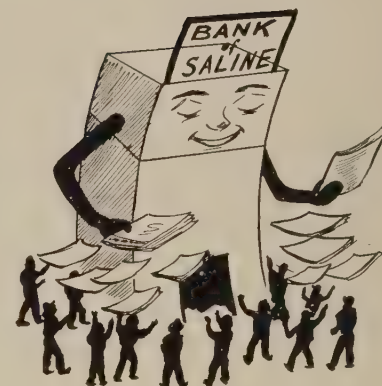
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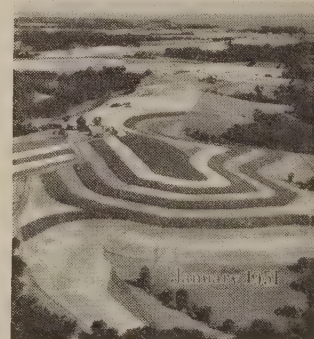


SMART BANKING.—The Bank of Saline in Louisiana believes in conservation farming. Recently the bank presented 22 farmers with subscriptions to SOIL CONSERVATION Magazine.

Saline, in the Saline Soil Conservation District, is the center of a small farming community. Cotton used to be a big crop, but severe erosion took its toll on the sandy, sloping land. Farmers started to apply soil conservation practices. Cattle, pine timber, and truck crops have now become major sources of income for Saline farmers.

Coordinated conservation farming is paying off in the Saline area in greater income and better living.

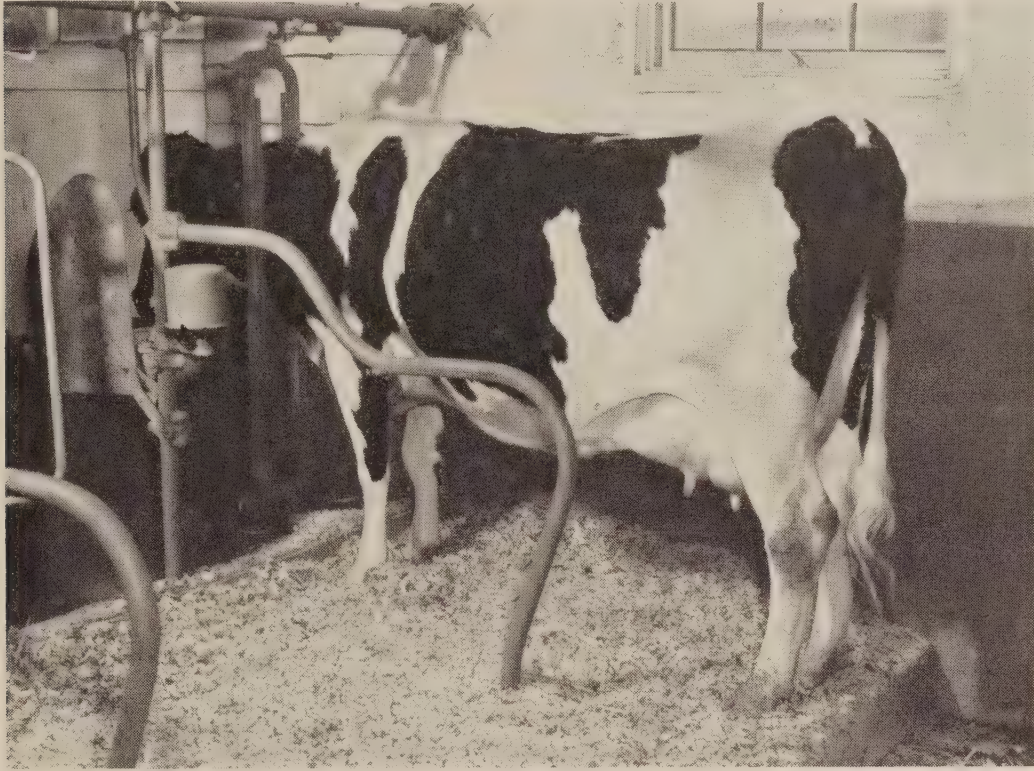
—O. O. MOORE.



FRONT COVER.—The shape of farming in Winona County, Minn. In foreground are contour strips of alfalfa, corn, and oats on the farm of William Thieke. Farther back may be seen the farms of Albert Thieke, Verran Ninteman, and Casper Ninteman. This is in the Pea Ridge section.

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PORTABLE WOOD CHIPPERS HAVE VARIETY OF USES



Wood chips used for dairy bedding at the R. M. Carpenter farm, New Castle County, Del.

By **ARTHUR C. MCINTYRE** and
MATT MIRANTZ

THE price of straw is of no serious concern to Bill and Avery Pulver, dairymen of Stanfordville, N. Y. During the 180-day barn season of 1949-50, they saved themselves more than \$24 per ton on 250 tons of wood-chip bedding used for their herd of 56 milkers.

The cost of the bedding ran \$5.90 per ton. Bill Pulver says that the cows much prefer it to straw. They lie down in it immediately after milking.

"When I tell you that straw sells for \$30 a ton around here, you can see that we won't have to run this chipper much longer before it has paid for itself," Bill observes.

That's only part of the story. Under their old cropping system, the Pulvers were using most of their cash to buy hay and grain and were scarcely more than keeping their heads above water. Shortly after the Dutchess County Soil Conservation District was formed in 1947, the brothers

became "cooperator number 3" and asked the district for help in making a complete conservation plan.

Bob Thornton, SCS representative then assisting the district, suggested that the 810-acre farm of hills and woods ought to be devoted largely to hay, hay-crop silage, and pasture. Up to then the emphasis had been on corn silage and oats for straw, and there had been too little hay. Grass and legumes were needed to build up the farm's fertility and hold the topsoil where it belonged.

But without oats, bedding loomed as a problem until Bill Pulver realized they were paying taxes on 411 acres of woods and getting very little in return. They had seen a wood chipper demonstrated and managed to locate an old one which they bought for \$450.

Once their trees are marked for selective cutting, the Pulver brothers hire a man to cut them in 8-foot lengths for \$5 a cord. It costs another \$5, the brothers estimate, to haul the wood to the barn in their home-made cord-capacity trailer, their horse-drawn sled, or their stake truck, and get it through the chipper. The chipper is mounted at one end of the barn alley. It takes 3 gallons of gas

NOTE.—The authors are, respectively, regional forester and information specialist, Soil Conservation Service, Upper Darby, Pa.

to get belt power for chipping 1 cord, plus \$12 to sharpen the chipper knives every 10 cords—a total of \$11.80 per cord. There are 2 tons of bedding per cord.

In 1949–50 the Pulver brothers used 125 cords of wood, chipping twice a week. They found that green wood chipped easier, but that seasoned stuff made finer chips, so they'll keep on using whatever is handy. As they don't store any, they have no worries about heating.

Thirty-six and a half acres, all but $3\frac{1}{2}$ in hay, got the benefit of 8 tons of chip manure every day last winter. The Pulvers especially like the way the stuff clears out of a spreader and sifts into the soil after a rain. Unlike straw, it doesn't stay on the surface.

"By selective and improvement cutting," says Bill, "we are making room for the best trees to grow, and this will give us saw timber in time. Then, too, our new system gives us all the hay and silage the herd will eat—and we've got 108 head, all told.

"Chips don't mat in the stalls like straw, and don't give off any dust. They're the easiest material for our type barn. They are cleaner to han-

dle, and when there's some cedar in them, they even give a pleasant smell to the barn."

By using wood chips or shavings as bedding or mulch, dairymen, orchard owners, and vegetable growers will find a material that is cheaper than anything else available, including home-grown straw. Wood chips handle easily going in and out of the barn, move evenly from a manure spreader, provide long-life organic matter for the soil. The chips are taken from wood that has very little value.

Fred W. Cornwall, owner of the Shore Acres Fruit Farm, Pultneyville, N. Y., gets rid of his orchard prunings by moving his new chipper through the orchard, spewing chips among the trees as a mulch with the cover crop. Being able to clear the ground before the spraying season starts is quite an item on the farm because brush left on the ground tangles in the sprayer. With the new chipper, two men can take care of the brush program before the sprayers come on. Before, two crews were needed, one for spraying and one for clearing brush, carrying it out of the orchard and tending a bonfire while it burned.

"The only thing we take out of the orchard now,"



Size is important. The representative sizes here, proceeding clockwise from lower left, are for dairy bedding, for poultry litter, for mulch, and for soil amendment to be plowed under.

says Cornwall, "is the fruit. All grass, leaves, and now these chips stay as mulch."

Many farmers prefer wood materials for bedding, but most complain, "Sure, but the sawmills either move too fast or too far." The arrival of the portable wood chipper has ended that argument.

When an acute shortage of dairy bedding in northern Vermont occurred during the winter of 1949-50, farmers in Lamoille County made 100- to 200-mile round trips to New Hampshire mills for sawdust. These stockpiles are going fast and the directors of the Lamoille County Soil Conservation District foresee an even worse shortage ahead.

At the same time, they noticed that local mill owners were burning their waste slabs. While lumbermen were interested in getting something for their waste, they didn't want to spend the time or the money to experiment. But the directors did. They went to a Massachusetts manufacturer with their problem and got a chipper designed that will take slabs up to 12 inches wide and 4 to 5 inches thick. Pending delivery, to tide the district over, the company loaned one—power take-off drive—that will take 6-inch slabs. The supervisors plan to rent the machine to cooperators for \$5 an hour, which will include the services of an operator. Sawmills will deliver slabs within a radius of 4 miles for \$1 a truckload, and next year cooperators of the Lamoille Soil Conservation District won't be making those long trips. Although the machine is built for slabs, it easily will handle wood-lot thinnings, and requests are already coming for the machine to chip these.

Easily towed by jeep or truck, or mounted on a tractor, a chipper can move right into a wood lot and make bedding out of everything from poles to twigs. It makes no difference how gnarled, knotty, or twisted they may be. If this arrangement doesn't suit, the chipper can be set up near a storage bin, the wood brought to it, and the chips blown directly into storage ready for spreading in the barn.

Each year farmers lose tremendous quantities of wood because trees are not harvested. The wood chipper can make every wood lot a source of bedding, and at the same time improve it by removing cripples and thinning to increase growth rates.

Without conflicting with the sale of pulpwood or saw timber, the chipper uses thinnings, limb wood, and tops left after logging operations are



The SCS nursery at Big Flats, N. Y., uses wood chips for mulch to produce better trees, shrubs, and other plants. It applies a minimum of 82 tons per year on 10 acres. C. N. Clement, manager, examines chips that have been spread for plowing under.

completed. At the same time, the lot is cleared of highly inflammable brush tangles.

Now, using wood chips for bedding is nothing new. It's the size and shape of chips that count. The amount of surface, more than the material itself, is the prime factor in how much it will absorb. And a pile of wood chips has plenty of absorbing surface.

Wood chips make a good blotter. A cord, or 128 cubic feet of coarse sawdust, will hold about 2,000 pounds of urine, which is as good as or better than the performance of straw. That becomes important when it is noted that nearly half the nitrogen and three-quarters of the potash in manure is in liquid form. Manure is 80 percent water by weight, and this 80 percent contains the most quickly and readily available plant nutrients.

Farmers use from 6 to 20 pounds of shavings or sawdust per cow per day. The smaller amount will absorb all of the liquid manure and still provide a clean bed. If 10 pounds are used, the manure is about 15 percent wood by weight. Most farmers prefer this liberal amount because it gives a more comfortable bed and also provides more organic matter for the soil.

"What will chip manure do to the land?" farmers often ask. Many State research stations have reported on the matter, and the summary of their findings is that woody manures are as good as any other kind, and sometimes a bit better.

At Rhode Island's agricultural experiment station, woody manures were spread at the rate of 3 to 4 cords per acre for 18 years on fields in a three-crop rotation. The report: Just as good as the fields where straw manures were used.

At Vermont they found that woody manure piles heated up no more than those piles in which the bedding material was mature hay. The Vermont workers also shattered the 'old wives' tale that "Wood makes soil sour." All plant ashes, they point out, are alkaline.

In January 1950, an on-the-spot test of a sample of woody manure on the Carlin Brothers' farm in Chester County, Pa., showed an average pH of from 6 to 6.5.

All farmers know that crop yields are sometimes reduced when organic matter is put on the soil. Wood is as much organic matter as hay or straw, and should be treated with nitrogen. Dr. O. J. Attoe, of the University of Wisconsin, recommends 50 pounds of ammonium nitrate or 75 pounds of ammonium sulphate per ton of bedding material. As much as 20 tons of woody manure per acre has been handled successfully when supplemented with nitrogen fertilizers, he adds.

The question of how much of this wood-chip bedding will be needed for any one year is easy to answer. In a dairy herd of 20 head, using 10 pounds of chips per animal per day for 210 days, the year's barn requirements would be 42,000 pounds. An average cord of wood weighs about 4,000 pounds. Dividing, we find that about 11 cords, or just a little more than half a cord per animal per year, will fill the bill.

Woody manure helps loosen up heavy soils. This makes for better aeration and allows more water to enter and move through the soil, promoting root development of crops. On sandy soils, woody manure improves water-holding capacity.

James Chadbourne, vegetable grower of North Bridgton, Maine, won a free dinner several years ago by raising the pH of a piece of land from 5 to 6.3 with a sawdust and nitrate treatment. A neighbor had bet that he couldn't do it without lime.

In Sharon, Mass., the Moose Hill farm chips brush and tree limbs in land-clearing jobs. Chips are blown back to cleared areas as mulch. In orchard work they are blown around the base of trees. Knives need sharpening after 30 hours' work.

Hilly and stony conditions at J. W. Hulbert's Nobscott Mountain orchards near Farmingham, Mass., sharply limit use of brush hooks and other brush- and limb-disposal devices, but a chipper does the whole job quickly and effectively. Hul-

bert chipped the trees and brush cleared from a large area, where burning was barred as a fire hazard. He got the chips for use in his orchards. Four men carried the brush to Hulbert, who fed the machine. It was run at half-throttle and used about a gallon of gasoline per hour. Chipper operations are more efficient than burning and end the fire hazard, the foreman said.

Cheever Newhall, manager of the 100-acre Pinnacle Farm orchard in New Hampton, N. H., chipped the prunings this year. With the machine it took three men 2 weeks to do a job that required the services of six men for 3 weeks last year. Elimination of a fire hazard that caused a lot of trouble in 1949, increases the value of chipper service, Newhall said.

In Connecticut, Charles A. Bartlett, of Somers, does custom and contract work with a chipper mounted on a jeep. Some customers use the chips to bed their farm animals; others use the chips for mulching. Bartlett charges \$5 per hour for the services of the chipper and an operator.

The Maryland State Conservation Committee has bought a chipper for the use of the cooperators in 23 Maryland soil conservation districts. In the Northeastern States more than 100 chippers are owned and operated by farmers or are available for the use of farmers.

Portable wood chippers are becoming available for farmers. They are made either with their own 30-horsepower gasoline engine, or the head alone can be purchased and operated from a power take-off. At present their comparatively high cost—from \$800 to \$2,000—prohibits ownership except by organizations such as soil conservation districts, or by custom operators.

STRAWS IN THE WIND.—Seed dealers in the Wiregrass Soil Conservation District are bragging about how many small seeders they're selling, according to T. G. Amason, district conservationist at Ozark, Ala. Amason said one dealer told him he sold 20 hand-operated, whirling-type seeders in 3 days. When Amason told another dealer about this the second dealer said, "That's nothing, I sold 4 dozen in 2 weeks and had to wire for an additional supply."

Amason also reports that there are now six or eight cultipackers in each of the six counties in the district whereas cultipackers were almost unheard of in that area 3 or 4 years ago.

"The seed dealers in general seem to be doing the best job they have ever done with their customers, encouraging them with proper land preparation, proper fertilization, and correct land use with soil conserving crops," said Amason.



Steep-sided ridge typical of McGregor watershed.

DAMS SAVE McGREGOR

By W. H. LATHROP

ON June 14, 1950, 6 inches of rain fell on McGregor, Iowa, in 3½ hours. Two and a half feet of water flowed down the main street. Silt piled on lawns and the storm sewer was damaged. The total cost to the town was about \$1,000.

Afterward, townspeople surveyed the flood litter. They were in an amiable frame of mind. Common comment was, "It's a good thing we had the dams."

McGregor folks haven't always been so relatively cheerful after a heavy rain. This Mississippi River town is in the narrow outlet of a 2,500-acre watershed. Old timers, and many not so old, recall when heavy rains sent 6-foot torrents down Main Street, flooding houses and stores. They recall streets and sewers filled with silt and rocks even after minor floods, and autos washed into the Mississippi. Before 1937 five floods in 20 years averaged more than \$50,000 damage each. But that was before conservation came to the watershed.

When the watershed became a demonstration project in 1935, McGregor businessmen asked the Soil Conservation Service for help with the flood



An old print of 1934, in which a car is shown being washed down the main street of McGregor.

problem. The plan that resulted called for a complete soil and water conservation program on the drainage area above the town and construction of detention dams to catch excess runoff water.

Under this program, up-and-down-hill farming in the watershed gave way to winding strips. More land is in grass, less in tilled crops. "Watch for the strip cropping when you go through the McGregor area," is standard advice to summer autoists. The town has purchased timberland in the watershed, which is protected against grazing.

The retention dams, designed to store and discharge runoff from a 50-year rain, got their big test June 14. Rocks up to 200 pounds were piled above the inlets. Some railroad tracks were washed out. No one ventured an estimate of the damage that would have been caused without the flood-control and soil conservation work.

NOTE.—The author is information specialist, Soil Conservation Service, Milwaukee, Wis.

"THE EARTH IS THE LORD'S AND THE FULNESS THEREOF"

By W. O. LAMBETH

ONE of the four great churches in rural America! That's what 100,000 ministers called Olive Chapel Baptist Church, Route 3, Apex, N. C., in 1949. In an interdenominational poll conducted by the *Christian Century*, this church was selected as the rural or small-town church most worthy of study in the southeast quarter of the Nation.

What has made this country church great? Many factors have contributed. Sturdy Anglo-Saxon pioneers settled in the community around 1740. Poor, but descended from good, sturdy stock, they were unshaken in their determination to wrest a livelihood from the soil. Land on the ridge between the Haw and Neuse Rivers where they settled sold for 6 cents an acre. The more fertile land in the valleys had been taken long before.

The first church in the community was organized 100 years ago by direct descendants of the original settlers. The first school was established soon thereafter, and the minister taught in a building on the church grounds. Today, many of the descendants of those first staunch settlers still farm in the community. The farms are small, but the fertility gradually has been built up.

Dr. Ralph Felton, of Drew Theological Seminary, Madison, N. J., found in a survey that 70 farmers in the community had an average gross income of \$5,322 in 1946. The average would probably be considerably higher today.

A former pastor, the Reverend Garland A. Hendricks, can look with pride on the honors that have come to this church. To him it is the fulfillment of a plan made 7 years ago. The Reverend Mr. Hendricks came to Olive Chapel Church in 1943 and remained there until November 1, 1950, when he left to begin a new venture in student-adult education as head of a department of Church-Community Development at Gardner-Webb College, Boiling Springs, N. C. Soon after assuming the pastorate, he inaugurated a well-planned program of church activities. Although deeply and primarily concerned with the religious welfare of the

people, he found time to engage in all community activities that would tend to develop his church members mentally and physically. In fact, due to his energetic efforts, the church has been the center of community life.

The Reverend Mr. Hendricks has always been vitally interested in how his members use their leisure time, as well as the way they till their soil. He decided early in his pastorate to do something about the raw gullies and red hillsides that were present on every farm. It did not seem to him that the one-crop system of tobacco farming prevalent in the community was putting the Lord's land to the purpose for which it was intended.

"What does it profit a country community," he reasoned, "if its people work and accumulate large tracts of land and bank accounts and forget that 'the earth is the Lord's and the fulness thereof, the world and they that dwell therein?'"

In 1944 he preached a regular Sunday morning sermon on soil erosion, pointing out that his members were not being faithful stewards of the soil if they permitted their fields to wash away and become unproductive. After this Sunday morning service, a farmer in the community who had been accustomed all his life to lifting his plow across gullies was heard to say, "I'll never see another gully without thinking someone has committed a great sin."

The Reverend Mr. Hendricks continued to preach and talk about the duties of faithful stewards to conserve the land. He continued to list mining and wasting the soil among the sins, and to exalt the virtues of conservation farming. This message he carried vigorously throughout the entire 70-square-mile community.

Farmers of the community use the help of the Neuse River Soil Conservation District. Their land-use plans are fashioned to take carefully into account the capabilities of the land. At the present time, practically every farmer has applied sound conservation practices. Among these are strip rotations, contour tillage, terraces, cover crops, pastures, woodland improvement, crop rotations, planting kudzu and sericea, and making wildlife borders and ponds in accordance with district recommendations.

NOTE.—The author is district conservationist, Soil Conservation Service, Raleigh, N. C. Photos by R. W. Stephens, Raleigh News & Observer.



The debt-free brick Olive Chapel Church has 9 acres of landscaped grounds, including an athletic field; a fully equipped two-story community building with kitchen, dining hall, Grange assembly room, and game room; a modern two-story parsonage; and a four-room cottage for the sexton.

The Olive Chapel minister delights in telling the story of the farm progress made by many members of his congregation. "Some time ago," he said, "I was in Apex about 9:30 one morning and saw one of my members cross the street. I saw that he was dressed up, so I asked him where he was going. 'Oh, I'm going to the sale to buy some cows,' he replied. I hadn't heard of any livestock sale so I asked where it was being held. 'Chicago,' he answered, 'I'm on my way to the Raleigh-Durham Airport. I'm flying up.'

"Well, he flew to Chicago, bought 16 fine Holstein cows, arranged for their shipment to North Carolina, flew back, and slept in his own bed that night.

"This same farmer—H. M. Olive—now a supervisor of the Neuse River Soil Conservation District, was a cotton-and-tobacco farmer back in 1934-35. He owned 85 acres of land, and the farm supported 5 people. Today 125 acres are providing a livelihood for 22 people. He grows no cotton and only a small acreage of tobacco, but he has 40 acres of permanent pasture and is milking 30 cows. He has seeded to grass all low, wet areas in his fields and is using them for meadow strips. His average tobacco yield has increased from 700 to 1,800 pounds per acre. As a result of conservation farming, he is also growing 100 bushels of corn to the acre on land that formerly produced only 15 bushels.

"Carl Goodwin, who lives just across the road from the church, has built three fish ponds, two of which are well stocked with bluegill and bass. Carl has 20 acres of bottom land seeded to Kentucky 31 fescue and Ladino clover for permanent pasture. This pasture supports 12 head of cattle. He didn't have to feed a bale of hay all last winter.

"One of the deacons in the church is J. Gordon Olive, former work unit conservationist for the Soil Conservation Service in Wake County and now holding the same position in adjoining Lee County. Olive has supported my efforts to establish conservation by planning the farms according to the capabilities of the land. He has not only helped me preach conservation of our land, but he has shown the way to other members of the congregation by his own farming methods. He has one of the best herds of Angus cattle in the county. Those cattle graze Ladino clover and Kentucky 31 fescue on hillsides that used to produce 15 to 20 bushels of corn per acre."

The 37-year-old minister could tell of countless

other members whose greatly increased incomes have enabled them to contribute more to the support of the church. It is a remarkable fact that the 555 members have contributed a yearly average of \$13,400 for all church purposes during his pastorate.



The Reverend Mr. Hendricks.

Mr. Hendricks' boundless energy and enthusiasm have made it possible for him to work actively in all endeavors designed to promote better living. Yet he has found time to do a lot of reading and research on rural problems. He has served as chairman of the Apex District School Board, taught a class in rural-church administration at Wake Forest College, written a column for a bi-weekly newspaper, served as State Grange chaplain, and as chairman of the Rural Church Committee of the Baptist State Convention in 1947. He attended the Baptist World Alliance at Copenhagen, Denmark, in 1947, and studied rural life in Denmark, Sweden, Norway, England, Scotland, Holland, Belgium, and France. He was named North Carolina's Rural Minister of the Year by the *Progressive Farmer* in 1948. A narrative history of the church, entitled "Biography of a Country Church," was released October 1, 1950, during the centennial celebration of Olive Chapel Church.

This debt-free brick church, built at a cost of \$45,000, could not be replaced now for less than \$100,000. It has 9 acres of beautifully land-

(Continued on next page)

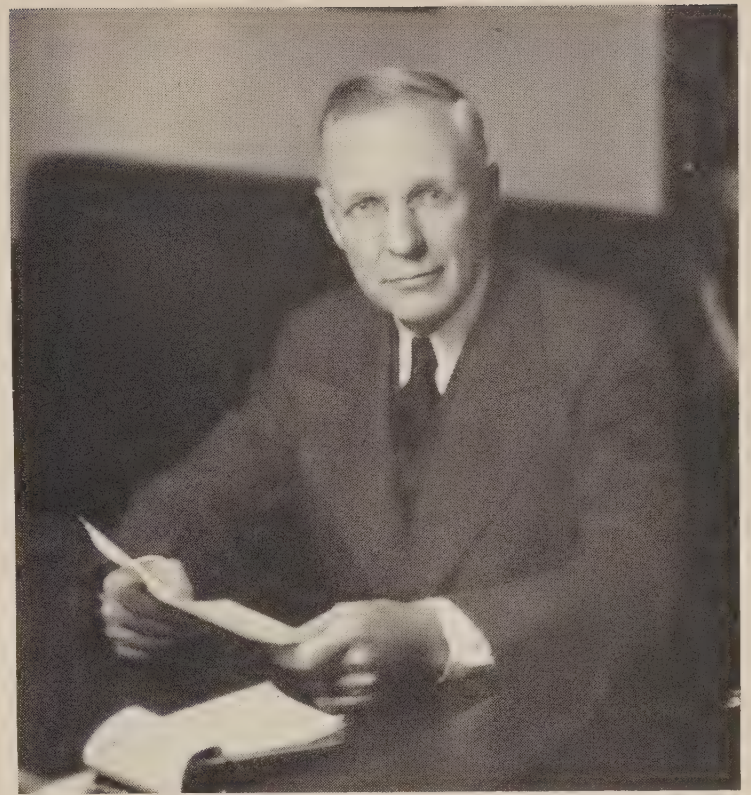
DISTRICT WORK LOWERS TOWN DEBTS.—Efficient use of labor-saving highway machinery in cooperative work with the Steuben County (N. Y.) Soil Conservation District, has been an important factor in wiping out or reducing town debts. For these services during 1949 and 1950, the district has paid \$25,747.88 to 16 Steuben County towns.

What this cooperative service means to these Steuben towns is demonstrated at Bath, county seat, where two district checks totaling \$7,720.69, placed Bath in the select group of tax-free townships for the first time in 10 years. The checks represented work done on about 100 farms. Wiping out the debt was accomplished in the face of ever-increasing postwar operating costs and machinery certificates exceeding \$50,000.

Steuben, like Alleghany, places a lot of operating importance on its heavy-equipment program. The districts own or control many pieces of equipment. In addition they utilize State, county, and town equipment, plus the services of private contractors who have lots of machinery. It was a heavy-equipment program that enabled the Alleghany district in June 1949 to build an average of a pond a day straight through the month. Alleghany had 29 pieces of equipment available to cooperators during 1949. Seventeen were owned by the district and 12 were on loan from local and county sources and from neighboring districts. This array of equipment represented an investment of more than a quarter million dollars.

Towns do not receive the same rate of pay that private contractors receive for use of equipment. The rates for State, town, and county equipment are set by the State Department of Public Works and the Office of the Comptroller of the State. In general these rates are about 25 percent lower than the rates charged by private contractors.

District payments made to the town of Bath for use of equipment from 1946 to 1950 total \$8,289. During the same years Pulteney received \$8,809 and during four of these years Hartsville was paid \$9,791.

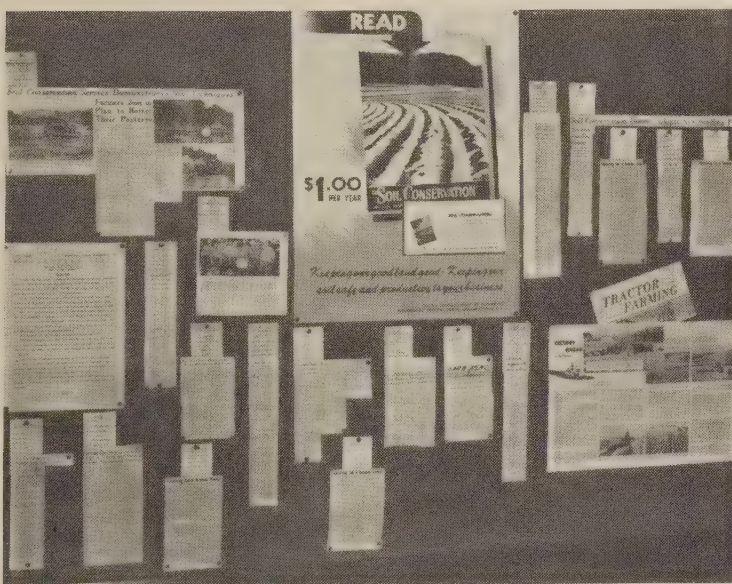


The late Albert S. Goss.

PASSING OF GREAT FARM LEADER.—Albert S. Goss, Master of the National Grange since 1941, died of a heart attack a few minutes after speaking on the New York Herald Tribune Forum, October 25.

Born and educated on the west coast, he engaged in milling and farming, operated a rural telephone business and country store. As he acquired experience and a reputation for unusual ability, his services were in increasing demand. For more than 30 years he worked in administrative capacities in cooperative associations, in rural banking, and in the Grange, both State and National. One of the things on which Goss insisted as Land Bank Commissioner (1933 to 1940) was that appraisers consider how the soil is being cared for before a loan is made. He was a strong advocate of a livestock-grass economy, and a consistent and effective advocate of soil conservation. He was a director of Friends of the Land.

Hugh Bennett, Chief of the Soil Conservation Service, cut short a field trip to return to Washington for the funeral, in which he was an honorary pallbearer.



New poster issued by Superintendent of Documents, which publicizes this magazine, holds center of bulletin board in regional office of Soil Conservation Service, Upper Darby, Pa.

“The Earth Is the Lord’s and the Fulness Thereof”

(Continued from preceding page)

scaped grounds, including an athletic field; a fully equipped two-story community building with kitchen, dining hall, Grange assembly room, and game room; a modern two-story parsonage; and a four-room frame cottage for the sexton.

Standing in the doorway of the church on the day of the centennial celebration, the Reverend Garland A. Hendricks could look eastward to the green pastured hills and fields of growing crops and see indeed a promised land.

Institute Dealt With Beef and Grass

By W. H. LATHROP

FIVE thousand Iowa and Minnesota farmers gathered at Albert Lea, Minn., one day last fall to attend what was probably the country's first institute on beef cattle and grassland farming. They came to see displays and listen to discussions on soil conservation and beef production. But mostly they came to hear Jake Sells and Bill Darbyshire, practical Minnesota and Iowa farmers, tell their own first-hand experiences in producing more beef at less cost with grass.

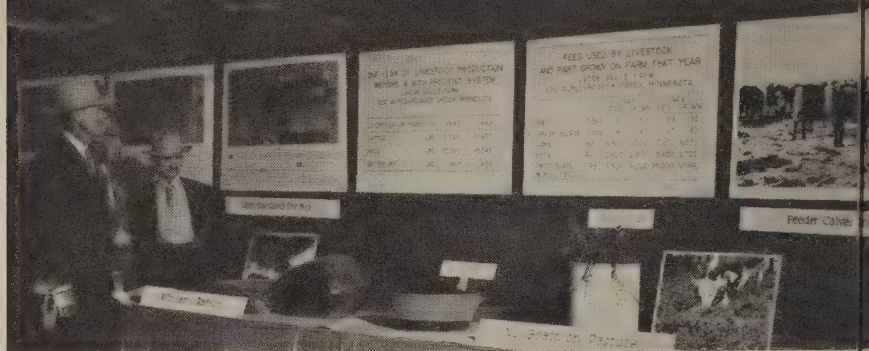
The attentive crowd overflowed the large institute building and spilled into a hall nearby where extra slides and microphone relayed the program. It studied charts and exhibits in the "clinic" building and joined groups to look at the pens of live feeder and fat cattle. Each event meshed with that succeeding, and when the day was over many were surprised that it was time to leave.

The Iowa-Minnesota Beef Cattle and the Land Institute succeeded primarily because it presented usable information. But into this smooth-running program went careful planning and a lot of just plain hard work.

The idea was born nearly 2 years ago when Mel Cohee, of the Soil Conservation Service at Milwaukee, sought methods to encourage greater utilization of forage and hay produced by the longer rotations called for in soil conservation farm plans. The natural solution would be increased production of beef and dairy products and sheep at lower cost. The idea was sound and he believed others would be interested.

(Continued on page 134)

NOTE.—The author is an information specialist, Soil Conservation Service, Milwaukee, Wis.



Cohee took the problem to Chicago meat packers, the logical industry to promote increased beef production. First he saw Jerry Thorne, vice president of Wilson & Co. Cohee outlined his plea for greater emphasis on good land-use and forage-consuming-livestock programs. Thorne offered help in trying a new kind of school for farmers in the Albert Lea trade area of Iowa and Minnesota. This is an area of the Corn Belt where soil conservation leans heavily on crop rotations with more legume-grass meadows. Here was a natural place to try a program with a new emphasis on land use and quality-beef production.

PICTURES ON PRECEDING PAGES

1. Maps, charts, enlargements, samples of feed and grass, were used at the clinic to explain all details of the Sells and Darbyshire soil conservation programs.
2. Acting Minnesota Extension Service Director Rutford made the keynote address.
3. Master of ceremonies was J. C. Holbert, president of the Iowa Beef Producers Association.
4. They conducted a panel discussion on grades of feeder cattle. Left to right: W. R. Morris, extension livestock specialist, Minnesota University; Rex Beresford, extension specialist in livestock marketing, Iowa State College; Les Doran, of Central Livestock Order Buying Company; and Floyd Snell, of the Peterson Sheep and Cattle Company.
5. They planned the clinic: William Zmolek, Iowa State College; Herb Flueck, Soil Conservation Service; William Imlau, Iowa State Department of Agriculture; Louis Larson, Minnesota State Association of Soil Conservation Districts; Elmer Miller, SCS, of Albert Lea, Minn.; Frank Mendell, SCS, Ames, Iowa; and R. E. Jacobs, of Albert Lea.
6. Iowa and Minnesota farmers listened attentively as Bill Darbyshire and Jake Sells told how grass and beef production fits into their soil conservation program.
7. At information booth in clinic building, County Agent R. E. Jacobs (third from right) and his staff answered questions; farmers signed up for bulletins.
8. At the clinic farmers examined samples of grasses, some old and some new.
9. Harold Shold, district conservationist, Storm Lake, Iowa, explains Bill Darbyshire's pasture methods at the institute clinic.
10. Hay samples under discussion: Melville H. Cohee, chief of regional project plans division, SCS, Milwaukee; Cliff Cairns, livestock division, Wilson & Co.; Herbert A. Flueck, Minnesota State soil conservationist.
11. Prize-winning Angus steer, marked to show cuts of beef.
12. Grass and pasture exhibits.
13. Elmer Miller, work group leader at Albert Lea, demonstrated runoff from hard-farmed and virgin soil at the institute clinic.

As details began to take shape, it became clear that the interests of many agencies were involved. A full effort would need full participation. An organization meeting held at Albert Lea in April was attended by 55 persons, representing the Iowa Beef Producers Association, the Minnesota Livestock and Breeders Association, the Iowa Farm Bureau Federation, the Minnesota Farm Bureau Federation, the Iowa and Minnesota Agricultural Extension Services, the Iowa and Minnesota Associations of Soil Conservation Districts, Wilson & Co., and the Soil Conservation Service. Cliff Cairns, of Albert Lea, was chosen general manager of the institute.

A seven-man executive committee accepted responsibility for the institute program. A clinic committee was appointed to plan exhibits and demonstrations. A publicity and information committee was assigned the job of getting news out to the farmers and all others who might be interested.

Even before organization there had been some actual spade work. Two farmers with representative soil conservation programs that included beef and grass had already been chosen—one in Iowa, one in Minnesota. They were selected by a group from the several sponsoring agencies after visiting some 30 farms in the 2 States. This step was taken in January, so that complete records, including a series of colored slides, could be started when the feeder cattle went into the lots from late-fall and early-winter pasture and cornstalk fields.

Enthusiasm grew as committee workers saw a real short course taking form. Publicity started with the mailing of 10,000 copies of an attractive four-page announcement illustrated with pictures of soil conservation work, the Sells and Darbyshire feeder cattle, and beef carcasses and cuts. Wilson & Co. built bleachers and provided chairs. Fortunately, the Freeborn County fair grounds have unusually spacious buildings.

The Albert Lea Chamber of Commerce arranged for picnic lunches at cost. The Central Livestock Order Buying Co., of St. Paul, furnished feeder cattle for the selection and grading demonstration. Wilson & Co. provided dressed carcasses. On Sunday and Monday before the institute, the clinic committee put up the exhibits. The cattle from the two farms and from St. Paul came to their pens early Tuesday, the day of the institute, September 26. Carcasses were hoisted above the speakers'

(Continued on page 138)

IMPROVED DRAINAGE IN THE IMPERIAL VALLEY, CALIFORNIA



Crops respond. This field of thrifty, profitable carrots typifies the healthy production which follows drainage, leveling, leaching, and other new techniques developed by SCS scientists.

ABOUT 10 years ago a small group of citizens from the Imperial Valley of California visited me in Washington to urge the Soil Conservation Service to help them with their drainage and alkali problems. It was pointed out with no

By **HUGH BENNETT**

little emphasis that more salt was entering the valley in the irrigation water from the Colorado River than was going out in the drainage water. That, I was told, didn't make the future of the valley look any too rosy, especially since a good many fields had already gone salty (alkaline) and were either out of production or producing only mediocre crops. My visitors didn't leave the impression that they were any too cheerful about the situation. Moreover, they didn't impress me as being any too happy about the tightening-up on farm loans in parts of the valley.

Attempts at drainage hadn't been altogether successful. Methods that had succeeded elsewhere in areas of more homogeneous soil conditions apparently were not everywhere adaptable to the alluvial soils of the Imperial Valley.



Turn on the water and flush out the salt! Allen C. "Ace" Bowen, soil conservationist, who designed the tile system for the field shown under water, shares the obvious satisfaction of Rancher Vernon P. Peck (left) in the way the system performs. Leaching water, which is furnished free by the irrigation district, will remain on this field 30 to 90 days, after which the soil will be ready for cultivation. There will still be some salt in the soil but not enough to hamper crop production. Subsequent irrigations will further reduce the salt content. Peck expects to double his alfalfa yield on this field.

The spokesman of the visiting group said, "You've got to help us."

"How?" I asked.

And the leader's response was, in effect: "With research, if you don't know what to do now. We think you can help us."

I didn't say that we had the answers, but did agree we would look into the possibility of getting some research going on the problem.

A research program for the valley eventually was developed, to be carried on in cooperation with the Imperial Irrigation District.

Early in 1941 a program was formulated, with the advice and assistance of local people. The main objectives were to determine (1) the source of the water causing the drainage difficulties and (2) how to remove excess water and salt from the soil. The program also covered the matters of how to improve irrigation practices and how to reclaim, safeguard, and properly use the land and water resources of the valley. This investigational program got under way in June 1941.

From 1941 to 1945, the research division of the Service worked on the problem of drainage, assisted by technicians from our operations division. A staff consisting of an engineer from the division of irrigation and an engineer and soil scientist from the division of operations of the Service was established to undertake the work. It soon became apparent that new methods would have to be developed and proved before an action program could get under way. Hence, the research phase assumed a dominant role during the first 5 years of work. Thereafter, both divisions worked together in a joint research-operational arrangement with the Imperial Irrigation District.

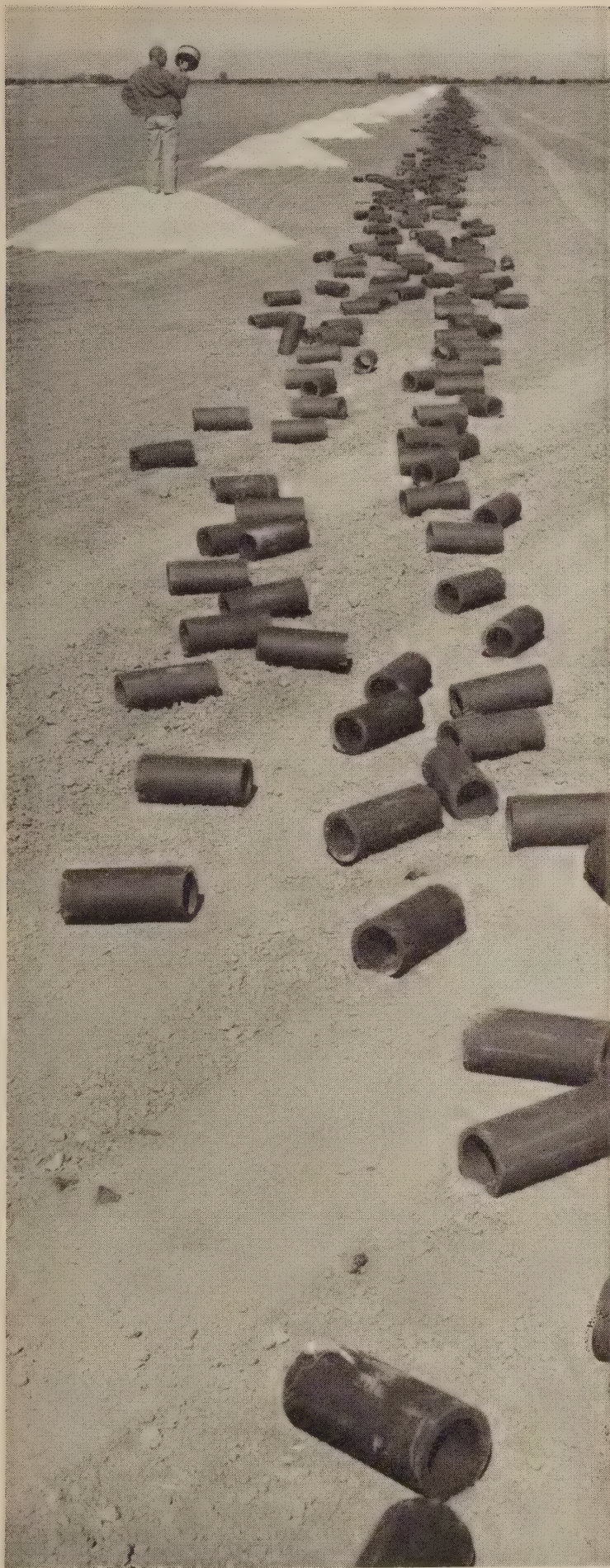
A soil-drainage survey was started, including soil profile studies extending to depths of 16 feet. Apparatuses were devised for quick underground water-table observations and for recording fluctuations in water tables. Techniques were developed for classifying soil according to ability to transmit water. Laboratory and field experiments were carried out to determine the amounts of water which would have to be drained off in order to keep the water table at a safe level and to leach out the saline materials by flooding. Finally, a tile-spacing formula was developed, checked in the laboratory and field, and put to successful use in designing applicable tile-drainage systems.

In December 1945 Service technicians began co-operating with the district in the preparation of

farm plans. This consisted primarily of planning for farm tile-drainage systems, improving irrigation practices, and developing a crop-rotation and drainage program which would utilize all the land according to capability and need. After the research program had progressed far enough to develop effective methods for drainage we were ready to go ahead with farm planning and land treatment. Through its investigations the Soil Conservation Service was prepared to show farmers what lands could be economically drained, where to place the tile lines so as to provide optimum drainage, and how far apart the drains should be under the different land conditions. In those places where drainage by tiling was not economical, crop rotations with rice helped to condition the land to a point where barley, flax, and other crops could be grown.

The technicians had learned how to determine the hydraulic permeability of the soil—how to locate clay barriers, chart seepage flows, determine artesian pressures, gage the efficiency of existing drains, make quick determinations of saline content of soils, develop plans for proper use of fertilizers, and determine the proper lengths of irrigation runs. These services were of vital importance to the farmers of the Imperial Valley. They were not available except through the Soil Conservation Service, yet without them the farmers of the valley had little hope of reclaiming their alkaline and water-logged lands, nor would loaning agencies continue their investments in the farms.

Since December 1945 the operational staff, with some assistance from research, has prepared farm plans covering a total of 17,505 acres of cropland. These plans provide for tiling about 15,000 acres. To date about 11,000 acres have been tiled, and the balance is in process of being tiled. Some 6,000 acres—more than half of the tiled land—have been leached of excessive salts. The balance has been partially leached or heavily flooded to start the process of salt removal by driving the saline elements downward and out through the tile system. Detailed provisions for soil and crop management and fertilizer application are included in the farm plans. Most of these provisions have been applied to the land. About 11,000 of the 17,505 acres planned were found to be in need of land leveling and improved irrigation and water-management practices. These changes also have been made.



This tile awaits burial 6 to 8 feet under surface. SCS research solved problem of where to put the tile lines, what kind of systems to use, how to cope with hidden "lenses."

The farm-planning program instituted in 1946 has progressed from a modest 160 acres, planned during the first half of 1946, to a present rate of nearly 6,000 planned acres annually. This rate of application appears to be about all that can be accomplished with present manpower. In addition to the work of farm planning and application, 28,485 acres of land have been surveyed in connection with a backlog of 100 applications for farm plans.

The early attempts at tiling land in the Imperial Valley met with only sporadic and mediocre success. Some systems worked, others failed. In places, especially where drainage was interfered with by impervious "barrier clay," crops had failed. Even as late as 1944 and 1945 the general farmer in the valley was not everywhere confident that tiling as a practice was the answer to his drainage problem. Farmers along a belt of land on the northeastern edge of the valley could tile with assurance of success. In the rest of the valley drainage was a hit-and-miss problem. The question in the mind of every farmer contacted in the early days of the program was: Will tiling work? But today the question in the minds of the farmers is: When can I get drainage assistance from the Service?

What has probably done as much for improving drainage conditions in the valley as anything else was the discovery of how to install tile drains so as to avoid the effects of irregularly shaped sub-surface lenses of impervious "barrier clay." Instead of laying the tile lines through such impervious material in straight-line arrangement, the tiles were installed so as to avoid these clays as much as possible, or to go through them at the narrowest points. This has done a great deal to remedy or void the impounding of water by the lenses under conditions favorable to the development of saline conditions.

The Imperial Irrigation District does the engineering work included in the farm plans. This staff lays out all tile lines, prepares and deepens open-drain outlets according to specifications, and inspects installation of the drainage systems. Soil Conservation Service does the planning, as stated, and helps with installations when called on. The pattern of operation is set by the farm-plan program. It has been adopted by the Imperial Irrigation District's engineering department, contractors, and individual farmers. Not only are 6,000-odd acres being planned annually, but nearly

14,000 other acres of land are being tiled every year. Thus some 70,000 acres of tilled land have been improved or brought back into productive condition as a result of the Service's activities in the valley.

Accomplishment, in terms of dollars based on increased land values, is estimated as follows, not counting the increasing annual increase derived from the work:

Abandoned land reclaimed by drainage (\$250 per acre)-----	\$10, 830, 000
Virgin wet land reclaimed by drainage (\$250 per acre)-----	2, 000, 000
Cultivated land improved by drainage (\$70 per acre)-----	1, 300, 000
	<hr/>
	14, 130, 000

The estimated annual net increase in crop production on the 70,000 acres drained as the result of the Service's work at a minimum of \$30 an acre amounts to \$2,100,000.

Also the intangible values associated with the return of 70,000 acres of sick land to production should not be overlooked. Thus, these formerly critically sick lands are being put on the tax rolls to share the cost of schools, roads, canals, and power lines. Roads, canals, and power lines go past sick lands as well as those on the production roll.

BEEF AND GRASS INSTITUTE

(Continued from page 134)

platform—direct from the coolers—before the crowd arrived.

People came from Wisconsin, Nebraska, South Dakota, Colorado, Oklahoma, Illinois, and other nearby States. The Universities of Iowa and Minnesota sent top-ranking agriculturists. Farm journals and press associations covered the event. Top officials of the Soil Conservation Service were on hand to help, along with those from Wilson & Co. and other sponsoring agencies.

Among the specialists, Bill Darbyshire and Jake Sells upheld their end of the show. Darbyshire, of Rockwell City, Iowa, told how his production of beef had jumped from less than 5,000 pounds in 1942 to more than 28,000 pounds in 1949. He still had 31 tons of hay, 2,872 bushels of corn, and 1,112 bushels of oats on hand at the end of his 1949 operations after turning out 26,400 pounds of pork and 28,800 pounds of beef. One pasture of alfalfa-brome—second-year meadow—brought him \$115

per acre in 1950 with 4 to 6 weeks still to go. His grain feeding accounted for one-half of his summer gains up to September 20 and his pasture for the other half.

Jake Sells, of Beaver Creek, Minn., told how his beef production earned \$60 to \$70 per acre from pasture. With corn he makes about \$50 per acre. He follows a 6-year rotation with 2 years of alfalfa-brome meadow. The first year of meadow goes for grass silage and hay. The first cutting is for the silo. The second year of meadow is pastured as needed and any surplus for this purpose goes for hay.

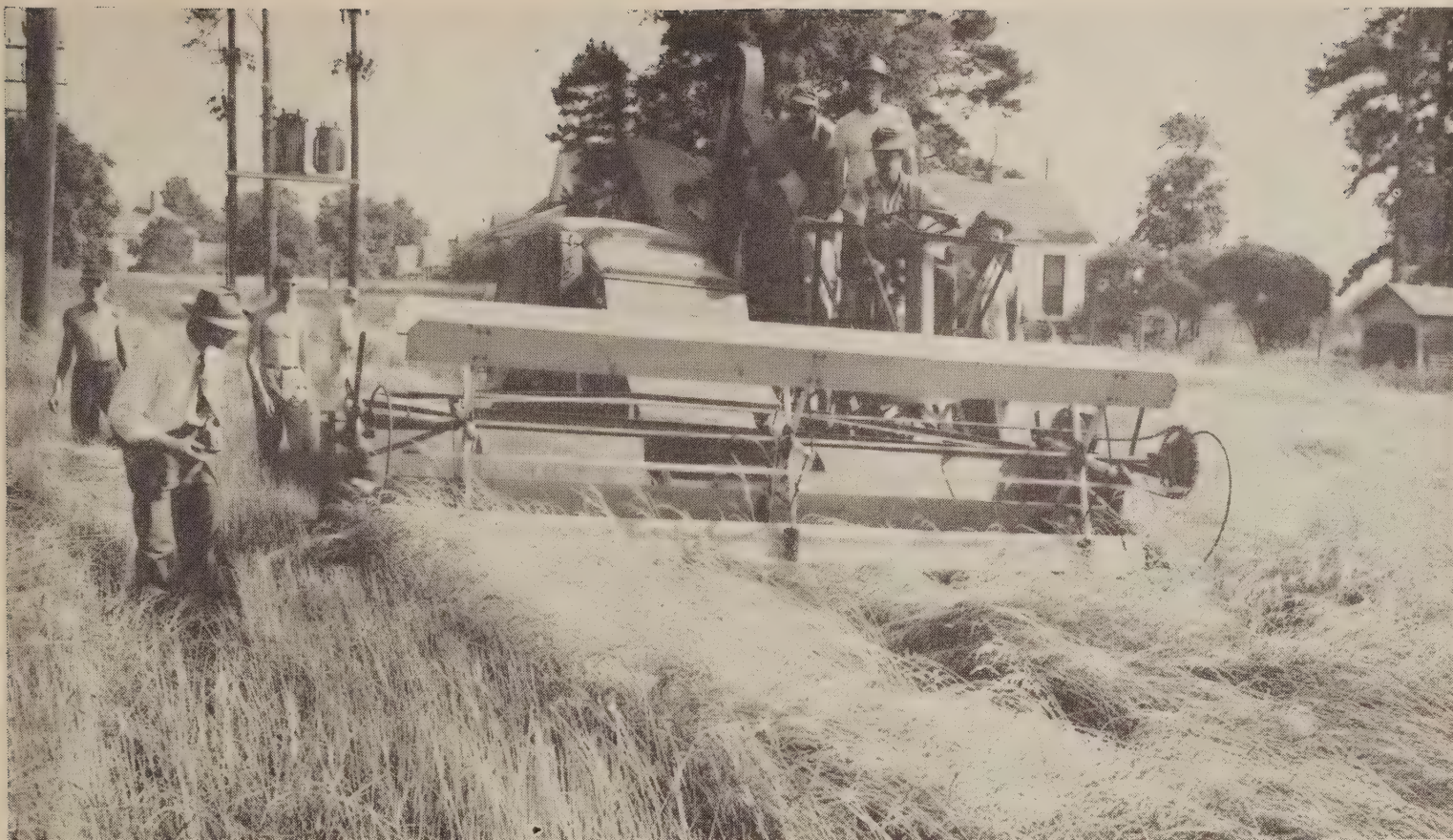
In his 1950 cattle-feeding program Sells obtained a gain of 515 pounds per steer from October 14 to September 20. The alfalfa-brome pasture accounted for 236 pounds of this gain, the remaining 279 pounds came from late-fall, early-wintering feeds gleaned from over the farm and the grain, hay, and silage. Spread over the total gain of 515 pounds per steer, the cost of feed, exclusive of spring and summer pasture, was 9½ cents per pound, at current market prices for feed.

Tentative plans already are being drawn for a Beef Cattle and Land Institute in 1951.



Further improvements being discussed by Bob Hatch and John Decker.

POND REWARDS INITIATIVE.—When Bob Hatch returned from war and went to farming with his father at Granby, in the Hampshire County (Mass.) Soil Conservation District, he set out to establish a number of conservation farming practices with his own farm equipment and labor. With technical help from Hermon Goodell and Ed Konieczny, Bob took his dad's bulldozer and built a farm pond with one-third acre of surface. He seeded the bank and planted shrubs and trees so that it will become a beauty spot. It serves several useful farm purposes and provides a place to swim and fish.



Self-propelled combine at start of 1950 harvest season on farm of Bailey Brothers, Woodleaf, N. C. A total of 125 acres was reserved for harvesting of Suiter's grass seed this year. This 3-acre field was planted from a grant of seed made by the Middle Yadkin Soil Conservation District; the seed was grown in an SCS nursery and allotted to districts. The yield from the field shown here was 650 pounds per acre.

NEW PLANTS CREATE NEW INDUSTRY

By WILLIAM B. LITTLE

AS SHARP changes come to agriculture throughout the country, new industries are being created. The cleaning and processing of seed of soil-conserving grasses and legumes, for example, has become a business of considerable importance.

Plants and plant residues are playing an increasingly vital role in bringing about safer and more profitable use of our land resources. Thus, a very great need for seed of plants not heretofore grown in quantity has arisen almost everywhere.

Observational plantings of such crops have been made from seed grown in Soil Conservation Service nurseries and allotted to soil conservation dis-

tricts. The Soil Conservation Service has searched diligently, and with a considerable measure of success, for plants to fit definite and often exacting conditions.

Successful trials have resulted in production of seed by farmers, both for increasing their own acreages of needed crops and for sale to others. Such production now adds up to many millions of pounds annually. No longer do a few large seed houses process most of the special crop seed for market; custom plants are being built closer to the source of supply. In some sections there is hardly a rural community without its seed-cleaning plant. A new industry has been born. It has been growing every year since 1935.

In one Southeastern State a conservative estimate based on a survey just completed shows there are now about 165 commercial seed-cleaning plants in operation, contrasted to possibly 10 in use at the time the Soil Conservation Service became a part of the Department of Agriculture. The same survey shows there are over 600 custom processing plants in the nine Southeastern States.

The seed grown in Soil Conservation Service nurseries are of species not readily available

NOTE.—The author is soil conservationist, Soil Conservation Service, Wadesboro, N. C. Information for this article, of a sort not readily available from all parts of the country, has been culled mostly from the nine Southeastern States.

through ordinary trade channels. The nurseries have made it possible to spread rapidly the use of such plants as blue lupine, Suiter's grass (Kentucky 31 fescue), kudzu, and sericea lespedeza. Planned conservation has stimulated the use of soil-conserving crops.

The acreage planted to annual lespedeza has been greatly increased in the last 10 to 12 years. Census figures have it that the seed harvest of this crop in the United States has increased from 43 million pounds in 1935 to 213 million pounds in 1946. In some places it is a vital contribution to the local economy. In Stanley County, N. C., for example, last year's seed crop from annual lespedeza amounted to over a million dollars in value, with prices lower than for several seasons.

The use of blue lupine, especially in Georgia, Mississippi, Florida, Alabama, and South Carolina, for winter cover following peanuts and other crops, has had considerable influence upon the agriculture of those States. In 1950 the crop of blue lupine seed amounted to a little over 148 million pounds in those five States, according to the Bureau of Agricultural Economics.

Some of the native grasses came into their own in 1949. Last year was favorable to the setting of a crop of grass seed in many parts of the country. Of the tall and midseason grasses alone, over 3½ million pounds were harvested. Most of this production was in Texas and Oklahoma. About two-thirds of it consisted of big bluestem, little bluestem, Indiangrass, and switchgrass.

Soil conservation districts in parts of Texas are highly pleased with guar as a plant which fits well into their conservation program. Seed production to extend its use has been expanding since 1948. Acreage of sweetclover continues to expand, especially in the Texas Blacklands.

Throughout the semiarid parts of the Middle West and Southwest an urgent need for drought-resistant plants has been partially met. This job alone required large amounts of seed of adapted plants.

More and more seed requires more and more processing facilities. The story is much the same everywhere.

Since recent demand for seed of especially adapted crops has exceeded the supply, prices have been high. Conservation farmers have profited by growing seed for sale and evidencing the truth in the old adage, "The early bird gets the worm."

There are several reasons why most of the seed-

processing business has been shifted to communities where the seed is grown.

For one thing, the volume has become so great that the cost of shipping to distant plants would be high. A considerable part of the seeds would then have to come back to the general vicinity where they were grown in the first place. Then again, hauling and handling is reduced in many instances by taking the seed directly from the field to the processing plant. In case of sale to the operator of the plant, the farmer often never sees the seed again.

Lastly, but most important, improved harvest methods have been devised to save seed formerly lost by shattering. This means green seed which must be immediately separated or dried in a volume not feasible without prompt access to a processing plant.

With the growing demand for some of the more commonly known plants, plus those introduced especially to fit certain land and climatic requirements, local cleaning, drying, and scarifying plants began to appear. Many operators of these plants engage in buying and selling. The smaller ones usually buy on contract for larger processors or for large seed dealers, and for sale directly to farmers in the neighborhood.

This new industry has been of economic benefit to many people.

Frank Nash, for example, a hydroelectric engineer of Mt. Gilead, N. C., nearing retirement age, became interested in the possibilities of sericea lespedeza. His first seed plot was started from a few plants bought from a neighbor at 1 cent each. Nash, now 72 years of age, does business as the Sericea Lespedeza Growers Association, Inc., and is regarded as leading the field in the processing and handling of sericea lespedeza seed. The products of the Nash plant go into half the States in the Nation. Last year he processed 450,000 pounds of sericea seed alone.

R. P. Stegall started in the early thirties a plant financed with \$500 of borrowed money. He cleaned 40,000 pounds of annual lespedeza that first year. Still doing business at the old but greatly expanded stand at Marshville, N. C., Stegall processed 6 million pounds of annual lespedeza seed last year. This was one of the earliest of custom seed-processing plants, and probably the first south of Richmond, Va.

In one State the Farmers Cooperative Exchange began a business of processing seed and dealing in

seed in 1935. They report growth in value. The first year they did a \$29,000 business in seed. Last year it reached \$2,000,000. Last year's volume of seed in pounds is given as approximately 3½ million pounds of Kobe lespedeza, 140,000 pounds of Ladino clover, 250,000 pounds of sericea lespedeza, and 300,000 pounds of tall fescue.

The practice of taking seed directly from the field to the plant for cleaning and/or drying, while it reduces expense of handling for the farmer, tends to create a congestion often hard to handle. This is greatly aggravated because of the time it usually takes, in at least some States, to get the required purity and germination test before sale. A private, licensed laboratory for making the test partially relieves this bottleneck at Marshville for Stegall and nearby processing plants.

Some of the clovers and other plants continue to bloom after a good seed crop has matured. Since the mature seed must be harvested promptly to prevent loss, there will, of course, be green seed put in the bag also. Such a mixture may heat and be damaged overnight if the green seed and particles of green leaves and stems are not quickly removed. It is usually impractical, when a large acreage is harvested, to prevent heating by spreading. The floor space seldom is available. This means quick and therefore local cleaning, and in many cases drying. For this reason, cleaning and drying plants for doing local custom work are real necessities.

The volume of blue lupine seed produced in some sections of the Southeast would hardly be possible without local cleaning and drying plants. With acre yields up to 1,500 pounds or more, farmers who harvest a large number of acres couldn't prevent heating and loss without such plants.

Crimson clover is being used more widely than ever, and when its seed is harvested in quantity, immediate cleaning is the logical way to prevent heating. Each of several Southeastern States now harvests more than a million pounds of this seed annually.

Several million pounds of wild winter peas, Singletary or Caley-peas, are saved for seed in Alabama and Mississippi. This also requires quick processing to prevent damage to germination from heat.

Tall fescue seed presents the same problem, though not to so serious an extent as some of the others. The volume of this seed harvested, however, has increased very rapidly.

In 1940 the Soil Conservation Service bought 70 pounds of Suiter's grass (Kentucky 31 fescue) from a son of W. M. Suiter, who discovered this grass on his mountain farm near Frenchberg, Ky. This was planted in a Soil Conservation Service nursery. Most of the acreage now planted to this grass in the Southeast has come from the increase of this 70 pounds.

Harvests of Suiter's grass in soil conservation districts this year have been very large. Jones Brothers of Huntsville, Ala., harvested this season 100,000 pounds of cleaned seed. As much as 100 acres harvested by individuals is not uncommon.

Buttonclover is becoming an important seed crop, especially in Tennessee and northern Alabama. One soil conservation district alone reported this year a harvest of 250,000 pounds, and the harvest was still incomplete.

The seed of buttonclover is extremely trashy as it comes from the combine. Facilities for cleaning as combined greatly simplify the harvesting.

Hairy indigo seed is being harvested in considerable quantity in Florida. It makes a good soil-improvement crop in most of the Southern States.

Processing plants today are as common in some sections of the South as cotton gins.

DRAINAGE DITCHES CAN BE EROSION, TOO

By WILLIAM A. ALBRECHT

THE loss of much good soil through erosion within a drainage ditch itself is not commonly mentioned as part of the cost of getting rid of surplus water. Ditches must be included as part of the erosion pattern. We have seldom considered how much erosion occurs when running water is working against the resistance to its flow by the creek or ditch banks.

For some estimate of how serious this erosion is, there are available the photographic records taken by Dr. F. L. Duley of the Soil Conservation Service at Lincoln, Nebr. They are of a drainage ditch cut by dredge to straighten the channel of the West

NOTE.—The author is chairman, department of soils, University of Missouri, Columbia, Mo.



In 28 years this dredged ditch cut itself from an original width of 20–25 feet to one of 5–8 rods, while it hauled away from 10 to 15 acres of fertile soil per section of land. It also cut itself deeper, as the circles marking the junction of the soil horizons indicate. (Photos by Duley.)

Fork of the Grand River in Worth County, Mo. The first two photographs were made in 1921 and 1923 looking upstream from the bridge at a point over the center of it. The third view—in 1949—could not be taken from the bridge because the bridge had fallen into or had been washed into the stream long before. Consequently, the left bank had to serve as the point from which to take the picture.

The soil profile of the ditch banks serves to indicate the depth of the water's cutting activities during the 28-year period of our story. The gray soil scattered at the top of each spoil bank repre-

sents the last soil thrown out from the bottom of the ditch during excavation (circles, photograph A). Consisting of more compact material, it was cut by the water to leave more nearly vertical banks than was the case for the soil just above it. The angle of slope, or pile, of the former is much greater than that of the latter (indicated by lines, photograph A). This is readily evident on the nearly freshly cut banks still not yet covered by any vegetation.

That the soil of the spoil banks was fertile is well indicated by the general and dense vegetative cover already well established there, and also on the stream banks, as early as 1923 (photograph B). That the ditch had already cut much deeper by that date is indicated by the top of the water along the two different soil horizons (circles in photograph B) which marked the near bottom of the ditch only 2 years before.

That same transition line in the soil profile, marking differences in glacial soil deposits (circle in photograph C) serves to point out the still greater depth to which this ditch had eroded by 1949. These facts, coupled with the disaster to transportation along the highway by having the bridge fall into the ditch, make the depth of 15 feet and the width of 150 feet tell us in no uncertain terms that serious soil losses are occurring through erosion even within our drainage ditches.

In 28 years the erosion within this ditch has closed a highway. It has cut the ditch from an original width of 20 to 25 feet to one of 5 to 8 rods. It has hauled away from 10 to 15 acres of fertile soil per section of land through which the ditch originally went as a straight line. All this erosion cost says nothing for the additional troubles and increased soil losses impending, now that the stream is starting to meander and to cut so much more severely at irregular points along its line. Erosion by ditches themselves must not be disregarded.

NOTES FROM THE DISTRICTS

PASTURE IN MINIATURE.—A grass nursery plot on city property across from SCS headquarters in Grapevine, Tex., helped the area's revegetation record in 1949 and 1950. More than 1,000 acres of KR bluestem were planted on cooperating farms in this work unit area in 1949 for seed production. Several hundred of acres of Suiter's grass also were planted.

Harold Hart, work unit conservationist, reports that many farmers, after looking at the various grasses, went



Hart pridefully surveys the grass nursery plot opposite headquarters.

to Service headquarters for additional information. As a result, additional acreages were planted and many farmers became cooperators with their soil conservation district.

Employees of the work unit took advantage of inclement weather to install and maintain the plot. The following plants are included: Suiter's grass, orchardgrass, brome grass, Indiangrass, little bluestem, big bluestem, side-oats grama, weeping lovegrass, buffalograss, KR bluestem, multiflora rose, and Angleton bluestem.

PRODUCER OF MULTIFLORA ROSE.—Interest that sprouted when he watched the development of a multiflora rose planting on his farm as a part of his complete conservation plan, led Glenn Jolliffe, of Knob Fork in the Upper Ohio Soil Conservation District, W. Va., to start production of multiflora as a new farm crop.

Jolliffe made his first plantings last April and May, using some straw but mostly sawdust as a mulch that was raked off as soon as the seed germinated. By mid-August the growth was 20 inches high. A month later it was 30 inches.

Some seeds were planted in rows; others were broadcast in beds. Jolliffe anticipates a production of 200,000 plants this year. He will use some on his farm and sell the others to district cooperators in West Virginia and other States.



Jolliffe weeding. Some straw, but more sawdust, is used as mulch. The mulch is raked off after germination takes place.



FIREMEN RESOLVE.—By joint action, Delaware's Volunteer Firemen's Association and the Delaware Fire Chiefs' Association have unanimously adopted a resolution approving the work being done by the Soil Conservation Service and endorsing the program of Delaware's three soil conservation districts. It urges Delaware farm owners to construct farm ponds wherever a suitable site exists as part of their complete conservation farm plan, and opposes field burning as commonly practiced because it is dangerous and destructive to life and property.

The action of the associations, representing 52 fire companies with nearly 6,000 members serving every community in the State, was taken at the annual State convention at New Castle last fall.



THIS IS CONSERVATION, TOO!—W. A. Hallisey and R. J. Wagner, conservation surveyors in California, were making a routine survey in a sparsely settled part of San Mateo County when they noticed flames leaping from a farmhouse roof. They rushed to the house and attempted to warn any occupants. No one answered their calls. Wagner seized the fire extinguisher from their car and climbed onto the roof from a low porch. By that time the roof was ablaze in several places.

While Wagner was emptying his fire extinguisher on the largest blaze, Hallisey located a garden hose and coupled it to a nearby faucet. He passed the hose to Wagner and then located a wrecking bar which Wagner used to tear out flaming shingles as he played water on the burning roof.

Just as the fire was brought under control Mrs. Ralph Dale emerged from the house and looked with consternation at the remnants of the blaze. She had brought her husband home from the hospital earlier in the day and was attending him in a back room of the house and failed to hear the surveyors' call.



From R. Y. Bailey, famed agronomist of the South, comes this pastoral portrait with the sage comment: "This is a modern conservation farmer. He is a custodian of the Nation's land. With the help he gets through his soil conservation district, he is taking care of his land and making it better. He is producing abundant crops of food, fiber, and other commodities that help to keep this Nation strong."



February 1951

Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION •

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

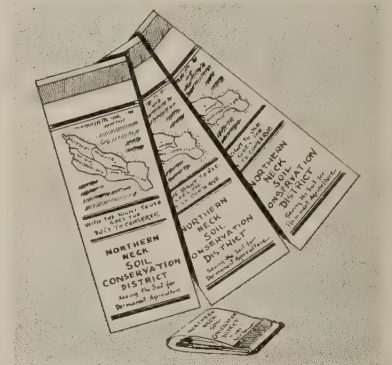
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BOOK MATCHES ISSUED.—The Northern Neck (Va.) Soil Conservation District, assisted by the Soil Conservation Service, is attempting to extend and work with more farmers in soil and water conservation. "Even though this district has been operating for 10 years, many of our people have not been sufficiently informed as to the services available in helping to combat losses of soil and water," writes James Latane, chairman of the board of supervisors.



"The little farmer, the marginal farmer, the beginner farmer, and farmers who do not receive current publications are among the ones we feel need to know more about what assistance is located within their county and how they may obtain such assistance in the way of a complete soil- and water-conservation plan.

"We felt that book matches with pertinent district information, well distributed to the country stores, service stations, and other gathering places, to be given to their customers along with purchases, would be informative, stimulate interest, and result in more requests from individuals and groups of farmers not previously worked with."

FRONT COVER.—Gladioli on contour on the loamy sand of the Elmer Gandy farm, Cumberland County, N. J. The site classifies as II and III land; the slope is 4 percent. Portable irrigation is used here. The farm is in the South Jersey Soil Conservation District. Harry R. Slayback is the photographer.

FARMING IN THE LAND OF THE MIDNIGHT SUN

By J. H. CHRIST



ON a 1914 soil reconnaissance of the Cook Inlet-Susitna region of Alaska, strapping Hugh H. Bennett found a million and a quarter acres of bench and plainlike country “quite favorable to farming.”

“About one-half of this good land occurs in the Susitna and Matanuska Valleys,” Bennett and Thomas D. Rice, his fellow soil surveyor, wrote in their report of their summer’s rugged work.

“The good agricultural lands—the benches, hillocks, and ridges—are largely occupied by the Knik soils, which have well-established drainage,” the men wrote.

In making the reconnaissance of some 40 million acres in the 1914 and 1916 summers Bennett’s parties used pack horses, rowboats, power boats, automobiles, river steamers, and the Copper River and Northwestern and the White Pass and Yukon Railroads.

Agricultural development of Alaska has centered in the area which Bennett and Rice delineated, particularly in the Matanuska Valley, which has had widespread mention.

NOTE.—The author is director, Pacific Region, Soil Conservation Service, Portland, Oreg.

Bennett then held the title of inspector in the old Bureau of Soils. Bennett today, 36 years later, is chief of the Soil Conservation Service, which is following up his 1914 and 1916 work in Alaska with more refined soil conservation surveys of promising portions of the Territory.

The Soil Conservation Service now has detailed conservation survey information on approximately 1 million acres of land in Alaska. Of this, 200,000 acres are represented in areas of the Public Domain withdrawn from settlement by order of the President of the United States until their value for agricultural use can be determined.

It was on Bennett’s findings that subsequent detailed studies under the leadership of William A. Rockie were started in 1939. Rockie’s conservation surveys provided inventory for the land surrounding Palmer, Matanuska, and Wasilla. The war years intervened, and work was resumed at Dunbar in the Tanana River Basin and at Kenai on the Kenai Peninsula in 1948. The year following, 1949, other potentially important areas were studied on the Kenai Peninsula, and surveys were completed at Kenai-Kasilof, Ninilchik, and Homer-Fritz Creek, the Department of Interior having



Class IV land near Fairbanks, properly protected when put in pasture.

withdrawn these lands from settlement for such a survey. The past season, 1950, has still further increased the coverage of detailed land information at Fairbanks, Homer, Anchorage, Chugiak and preliminary material at Salcha-Big Delta.

Although a farming of sorts has been going on in Alaska for more than a century, it was not until 1935 that there was a major influx of settlers. This was the Matanuska Colony undertaken through the medium of the Alaska Rural Rehabilitation Corporation. Started as a relief measure during the depression years of the thirties, the produce of these farms and others in the Territory provided materially to the armed forces stationed in Alaska in World War II. It showed conclusively, too, that there was an agricultural future for this great land, and that sound agricultural settlement was needed to provide local products to the key military establishments that provide a protective facet for the North American mainland.

There is no doubt that many believe strongly in Alaska's agricultural future. Following the war many veterans exercised their GI privileges in taking up homesteads in locations of their choice. Even at this date filings for land are recorded at a rate of 60 to 70 a month during the months that the lands can be examined.

It is to help these settlers that accurate information is being secured. Critics have often declaimed the policy of our Government in permitting settlement of land poorly suited to farming. However, without facts pointing up the character of the land and its potentialities and its limitations, little else could have been expected. But now on this new frontier we do have the facts, and they are available to settlers wishing to have a reliable guide for their investment and effort.

The Alaska Soil Conservation District law, enacted in 1947, declared the entire Territory of 586,000 square miles a soil conservation district. In the Subdistricts formed at Palmer, Wasilla, Chugiak, Anchorage, Homer, Fairbanks, and Salcha-Big Delta, land-capability information is now available at the offices of these units of Territorial Government.

There is good land in Alaska. The proof of this is shown on the farms in many localities. Yields are good and quality is high. But not all the favorable-appearing land is good, nor can it be farmed indifferently. Wind and water erosion can be just as damaging in Alaska as it is on State-side lands.

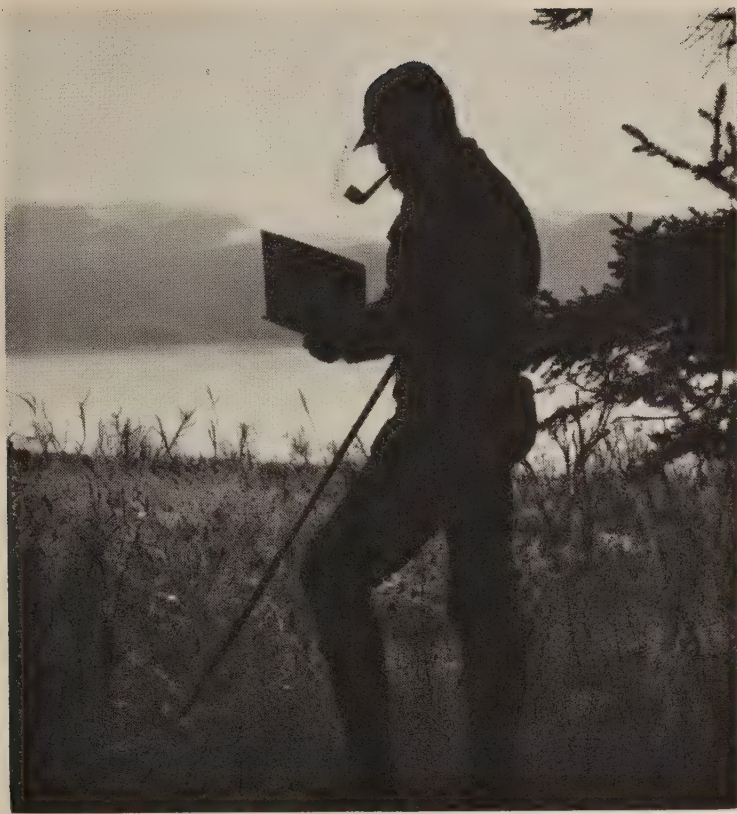
Deteriorating yields through reduction of fertility can come about even more rapidly because Alaska's lands are not inherently high in fertility. Of the area mapped, about 20 percent falls in Classes II and III, those primarily adapted to cultivated crops; 20 percent in Class IV, which has best use in meadow and pasture; and the balance in Classes V, VI, and VII, which may be used for range or timber production; or Class VIII, which, because of steepness, rocky character, or climate, has no agricultural value.

An observer from outside will quickly note the shallow silt profile that overlies the gravels of the Kenai Peninsula, the Matanuska and Susitna Valleys, and the Delta Valley of the middle Tanana region. Again, he will marvel at the depth of the silt deposits in the Fairbanks section. And, interspersed with these, he will note the extensive areas of muskeg. The boggy, poorly drained areas are present in all localities.

Yes, you're going to use a new set of standards to interpret the things you see. Anyone striking out blindly has every chance of loading up on a heartache. Even on the best lands it's no bed of roses. As a GI homesteader put it to me, "This easy-money idea is a laugh—making anything out of a homestead is the hardest money I ever earned." Then he added, "But we like it. We're running our own outfit, it's a good place to live and a good place to bring up kids."

Another thing to learn is that farm crops are limited to a narrow elevational range and that they are greatly affected by the direction of slope. Rather arbitrarily, the uppermost limit is in the vicinity of the 1,000-foot contour. Favorable air currents raise it in some sections, lower it in others. Then, too, it drops off as one goes farther north. Remember, also, that the sun's rays hit these lands at a low angle. For that reason north slopes are extremely slow to warm up, and frozen ground can be found almost on the surface throughout the summer in the interior.

Root crops and leafy vegetables give excellent yields under good management. The bounty of these crops leads the settler to rely on them for his early cash income. After all, it's about the only move that can be made on the small acreage initially cleared to put hard money in the pockets of the settler. But it's highly competitive, for just as the newcomer sees an early return from his land in these crops so also does the farmer who has a



The glamour of glacier and snowcapped peaks across Cook Inlet is somewhat lost on busy soil scientist.

greater acreage of cleared land, and who also has learned how to grade and package his produce, and who has also established a firm market outlet for his crops. After all, there is a limit to the consumption of cabbage, rutabagas, beets, potatoes, lettuce, chard, and the like.

The farsighted farmers are taking a realistic attitude toward their future. They see the ease with which the cash-crop market can be broken, and they see the same erosion pattern starting that earmarks much of the one-crop farming in the States. Naturally, their ideas shape up in a permanent cropping system that includes livestock as its core. There are winter hardy grasses and legumes adapted to Alaskan conditions. Sure, there are severe years when there are heavy winter losses, but don't we find the same conditions prevailing at times in our northern tier of States? We likewise find winter losses the heaviest when the stands are weakened by heavy grazing or run down by poor fertility-maintenance practices. So, necessarily, good management is just as essential to good farming in this Land of the Midnight Sun as it is elsewhere.

The settler needs to learn how to take care of forage under the conditions of summer rainfall, less so in the Central Tanana sector than down toward Palmer and Kenai. Maybe he will be

willing to sacrifice somewhat on yield to gather in an early crop when the good weather prevails, or he may have a silo and silage-producing equipment so that the feed reserve can be preserved in the more inclement weather. Or he may field-cure his hay by the more laborious process of shocking it on standards, a sight frequently pictured in rural Scandinavian scenes. Strangely, hay so stacked continues to cure and provides a feed high in quality.

Over the years, the plant breeders of Alaska and of foreign countries in the same latitude have developed varieties of barley, wheat, and oats that give pretty reliable returns, thus cutting down on an expensive feed bill for the shipped-in concentrates. Varieties suited to the use of a combine have yet to be isolated, so the binder and field shocking are standard practice. The crop at times may be threshed from the field, or it may be stacked and threshed after the weather settles into the colder months.

With farming shaped up about a livestock economy, certain benefits are apparent. An easily flooded vegetable market is avoided, and the elements of good land husbandry are on top. The same processes that formed these soils are ever present to tear them down. Winds of high velocity whip up the glacial flour from the annual deposits along the bars of the streams. None of the land so built has a great enough depth to warrant having it exposed by ill-considered farming methods. A good winter cover is essential, and a rotation that includes long-lived grasses and legumes builds up the organic matter, and with it the fertility. Windbreaks of native timber, spaced at appropriate intervals, both as the farm is being developed and later to furnish protection to the intervening cultivated strips and a future fuel and lumber supply, seem to have an important place in the farming scheme.

On the sloping lands and deeper soils laid down as water or loessial deposits the water-erosion hazards are high. These immature soils have high erosion tendencies. They cut quickly and deeply as runoff water concentrates on them. Here contour farming can be used effectively, and experience may show that terracing or diversion channels, coupled with crop rotations, have an important place. Sheet erosion is present, too, and rain on the thawing soil in the spring can flush a layer of

(Continued on page 152)

A DAY AT RED HILL PLANTATION

NEIGHBORS for miles around assembled in the foggy dawn of October 18 to help the Reverend Ralph Bellwood apply a soil-saving sermon to the lands of the Red Hill plantation in Virginia. There were some 10,000 of them present.

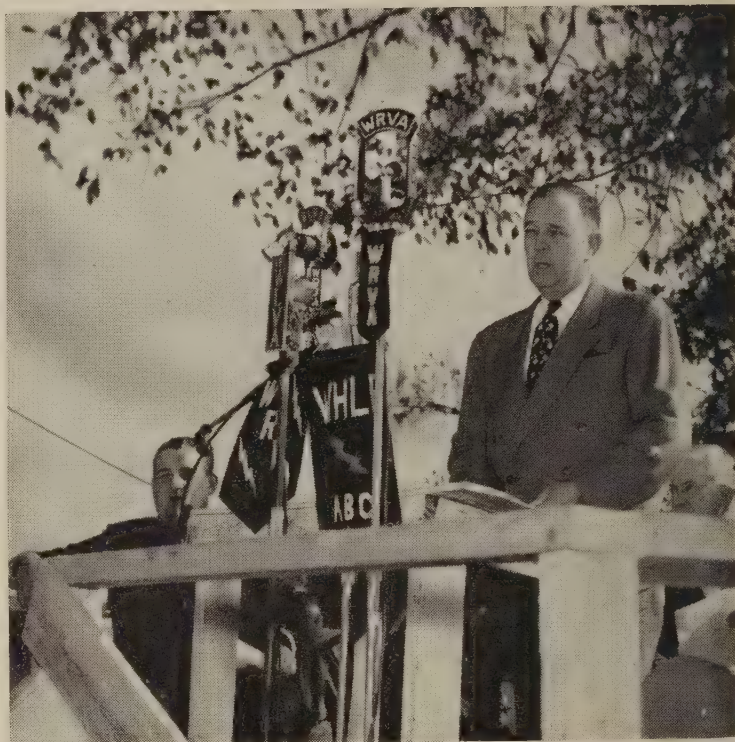
The event was notable for two reasons. First, Red Hill was the plantation where Patrick Henry, American patriot and conservationist, farmed during his declining years. Second, the Patrick Henry Foundation had given the Reverend Mr. Bellwood use of the estate as a home for "problem" boys.

Patrick Henry is generally remembered for his speech at the second "revolutionary" convention called in Virginia, urging the colony to arm her militia. He is also remembered as having said in 1790, "He is the greatest patriot who stops the most gullies." Not so well in mind, however, is the fact that Patrick Henry himself was something of a problem as a boy, before he rose to fame.

Mr. Bellwood, who had done considerable work with young people in his ministerial charges in Southside, Va., had also observed the beneficial

NOTE.—The author is soil scientist, Soil Conservation Service, Chase City, Va.

By N. B. PFEIFFER



Regional Director Buie said the day's happenings appropriately reflected Patrick Henry's interest in conservation and democratic action.



Lynn Shelton, editor of the *Halifax Gazette*, and T. S. Buie being impressed by almost priceless boxwood at Red Hill plantation.



Part of the 10,000 who watched transformation of plantation.

results of soil conservation district work in his travels throughout the Commonwealth. So when the foundation granted him the use of the land for his project, he decided to see what could be done to rehabilitate both problem boys and problem land. For in spite of Patrick Henry's noble sentiment, galls and gullies had multiplied alarmingly since the patriot's death in 1799.

Red Hill plantation lies in both Charlotte and Campbell Counties, in the Southside and the Robert E. Lee Soil Conservation Districts. When Mr. Bellwood called on the supervisors of the two districts, they readily agreed to sponsor the land-conservation portion of the program. The Soil Conservation Service, the Virginia Forest Service, the Commission of Game and Inland Fisheries, the State Department of Vocation Education, and the Virginia Agricultural Extension Service assisted the supervisors in technical aspects of the work.

The Soil Conservation Service, in cooperation with Mr. Bellwood and assisted by collaborating agencies, prepared a complete farm plan, based on the capabilities of the land. Nearly all of the 1,000 acres now included in the plantation had been in cultivation at one time or another. Tobacco, corn, and other crops have been grown there for two centuries. Old crop rows can still be seen under

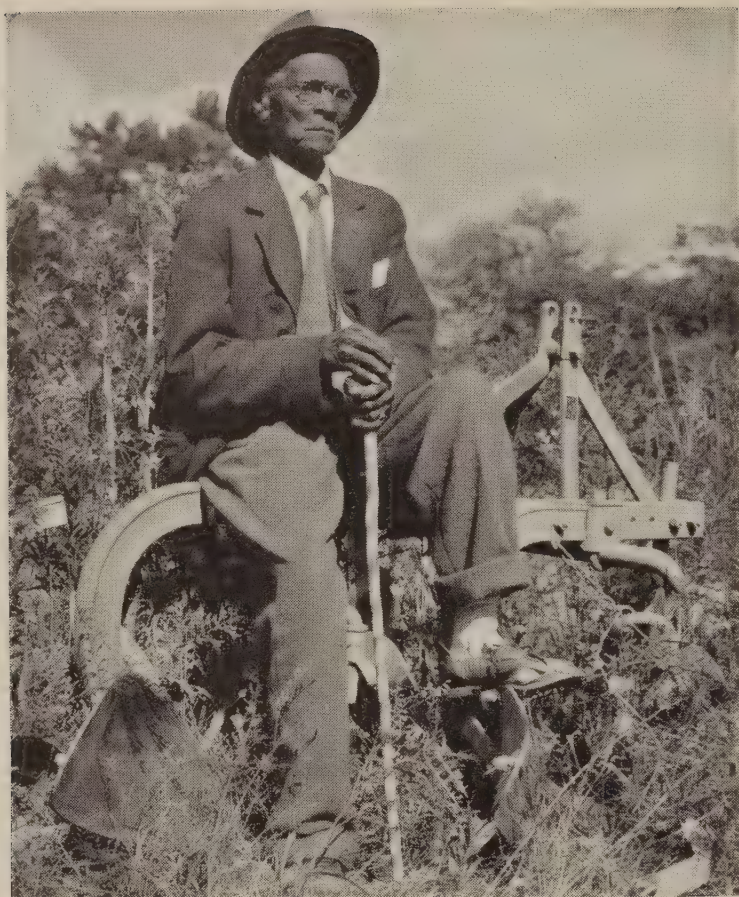
the cover of "spruce pine" on many acres. The once-fertile bottom lands along the Staunton River, no longer suitable for corn, can be used only for pasture. They remain wet for long periods and are flooded frequently because of the silted stream channel.

Nearly all of the material and equipment used in the rehabilitation program was donated by local dealers. A 70-year-old Negro, who owns an adjoining farm, cut nearly 700 fence posts. By daylight, a small army of volunteer workers, operating 50 tractors and 3 bulldozers, was in the field filling gullies, disking, liming, fertilizing, and seeding. Some 350 veterans, both white and Negro, helped do the work as part of their training.

The road leading to the farm was repaired, banks were sloped, and drainage ditches were opened by the State Highway Department. Home demonstration clubs, church and civic organizations sold lunches to the spectators and furnished free lunch for the veterans. Boy Scouts helped highway patrolmen direct traffic.

S. A. Ozlin, chairman of the Southside district's board of supervisors, presided.

T. S. Buie, Southeastern regional director of the Soil Conservation Service, reminded the gathering that it was Patrick Henry, fiery orator of liberty,



Albert Pannell, 102-year-old former slave, marveled at the "miracle."

who preached and practiced the gospel of stopping gullies.

William Tuck, former Governor of Virginia, declared, "It is especially encouraging to see the restoration of the Patrick Henry plantation because it is symbolic of the character rebuilding which is to follow. I congratulate the Patrick Henry Foundation, which is making this historic spot available for the rehabilitation of problem boys."

It was during Governor Tuck's administration that the Virginia General Assembly appropriated more than \$50,000 for the restoration of the estate. James S. Easley, of Halifax, Va., president of the foundation, reports that the foundation has now paid the last debt on Red Hill.

Mr. Bellwood said that soil conservation would be a major part of the training the boys will receive at "Patrick Henry Boys Plantation."

Among the guests were Albert Pannell, 102-year-old former slave, who still makes his home on a part of the original plantation, and George Britton, a descendant of the Henry slaves, who stood by the grave during the day and expounded on the virtues of the old master of Red Hill.

Representatives of seven radio stations and as

many newspapers handled reports of the day, and motion pictures of the event were made. Editor Lynn Shelton, of the *Halifax Gazette*, handled advance releases through the newspapers and radio stations of the area.



Former Governor Tuck commends use of plantation as rehabilitation home for problem boys.

LAND OF MIDNIGHT SUN

(Continued from page 149)

the most productive soil from the slopes and re-deposit it on the bottom lands.

The prospective settler today may well think over the 1914 suggestion of Bennett and Rice. "Before going to Alaska it would be strongly advisable for the prospective immigrant to make a careful study of the geography of the region, its climate, soils, crops, transportation facilities, market conditions, and population; and sufficient capital should be available to carry the new farmer through a period of one or more years during which he will be busy clearing land and constructing necessary buildings."

So, wherever you go you find that good judgment needs to be the companion of good farming. There's no more reason for laxity in developing a farm in Alaska than there is in the States. There are people there who realize this, and their counsel can be used to excellent advantage by the farmer who is caught irresistibly by the wonders and drawing power of the Northland.

WATER IN THE GROUND: TOO MUCH OR TOO LITTLE

By **HUGH BENNETT**

MORE and more I am struck by the important part which water plays in our national economy. Too much here, too little there, across the seasons can help or hurt the land, the crops, and the users of water. Nearly everything depends on how water is used or managed.

All in all, for decades, water has seldom, if ever, been in exactly the right amount, at the right place and the right time.

Some of this unbalance can be corrected. Farmers and ranchers are beginning to get acquainted with water management in the nearly 2,300 soil conservation districts over the Nation. We are finding, too, that we have not yet learned all we need to know about either erosion control or water management. True, this necessitates some delay

at certain points; but that doesn't stop progress. We are moving with the field job wherever we have adequate information—and, through research and experience, we now have a great deal of basic and practical information to enable us to move ahead.

During the past few years, as in the 1930's, we have experienced the opposite extremes of severe shortages and severe excesses of water. Serious droughts have occurred in New England and the Southwest, and locally across the central part of the country. During the same period there have been some of the worst floods in history along the Columbia, the Ohio, and other rivers. The floods not only have destroyed many thousands of acres of crops but have ruined for further immediate cultivation thousands of acres of highly productive land.



Hugh Bennett casts an appraising eye on an oatfield near Monte Vista, which illustrates need for water-table management. Elsewhere in this area the oats were waist-high and calculated to induce a more pleased reaction.

As a result of the drama of flood and drought, laymen and professional people alike have become increasingly aware of the importance of water in our national life. When we consider the tremendous effects of shortages and excesses on our productive capacity, our health, our well-being, and our national economy, the water and land problem builds up to staggering importance. I doubt if there's any other problem, with the single exception of war itself, that bears so heavily on the entire population.

And so, I keep on journeying about the country for the purpose of keeping abreast of our rapidly advancing soil and water conservation program.

Early last fall I met with some of our leaders in the Soil Conservation Service at the colorful old Indian-Spanish-American town of Taos, N. Mex.—once an important agricultural area of the early Spanish occupation of the Southwest. The subject of water had top billing on our agenda. We labored for several days hewing out a more fully developed and, I hope, sturdy set of guiding principles. We agreed that the Soil Conservation Service must do everything possible within available resources to provide help and guidance to landowners and water users who are confronted with new and complex water problems related to the land.

Some of us, quite naturally, browsed around in the evenings to enjoy the famous old town and countryside with its picturesque Indian and Spanish-American people living much as they did 300 years ago. We examined and purchased some of the wares of the local art colony, which has taken up living the simple country life of the *rancheros* while capturing some of its beauty and interest on canvas, especially the beautiful mountain scenery, autumn coloring, and native characteristics.

After our deliberations, I took the opportunity to get into the field to see first-hand how we are getting along with conservation operations. We traveled north to one of the most unusual agricultural areas on the North American continent—the mile-and-a-half-high San Luis Valley of Colorado about the headwaters of the Rio Grande. This area, as big as the State of Connecticut, nestles between the lofty Sangre de Cristo Mountains on the east and the San Juan Mountains of the Continental Divide on the west. From the snow-captured waters of these mountains flows the life blood of the Rio Grande Valley—water for irrigation and other uses.

High mountains surround the valley on all sides, save the low lava-capped hills near the State line. According to Weather Bureau records, the valley floor receives an average of only about 7 inches of precipitation, but the higher mountains get up to 40 inches a year, much of which comes in the form of snow. Melting snow provides most of the stream flow from April to July, on which irrigation agriculture, industry, and municipalities are dependent for hundreds of miles to the south.

The river and other mountain streams have carried sand, gravel, and clay into the valley for undetermined centuries—to the point where a closed basin has been built up by impervious geological substrata lying to the north and east of the Rio Grande. These deposits have blocked the exit of many small streams. Some water enters the closed basin from the Rio Grande to the west, where it comes out of the high canyon country near Del Norte, percolating into and through the coarse gravel substrata. Beyond this point, there is probably little or no outlet of surface and ground water to the Rio Grande, except that provided by the artificial drainage systems. The trapped waters of the closed basin form a huge underground reservoir. Some of the waters are also confined between impervious substrata, producing two distinct layers of artesian waters, one of which is said to be pure enough for use in batteries. However, the shallow ground water moving in the coarse gravel lying immediately below the soil mantle is the principal source of water for subirrigation.

Water for irrigation purposes has been imported into the closed basin by diversion from the Rio Grande since shortly after the Civil War. In addition, subirrigation has been practiced by “checking” drainage ditches so as to build up the water table sufficiently to meet the high water requirements of the relatively open, porous soils, especially on the west side of the valley. This, without sufficient natural or artificial return drainage to the river, has resulted in the local accumulation in the soil of large quantities of alkali salts, with consequent reduction in crop yields, a break-down in the soil structure, and the abandonment of some thousands of acres of valuable farm lands.

As we entered the irrigated area, I began to ask questions of Joe Sexton, our local Soil Conservation Service representative working with the soil conservation district supervisors and cooperating farmers in the valley. “What about crop yields?”



Open drain in Rio Grande Drainage District. Irrigation farmers, the Rio Grande Soil Conservation District, the Soil Conservation Service, and the local drainage district all work together on the program of improved water-table management.

I inquired. "Have they declined in some localities and increased in others?"

Joe replied that the yields were materially lower in areas where slope, soil structure, water table, and alkali conditions constitute a serious problem and conservation measures have not been applied as yet. But in other areas where these conditions have been corrected, the farmers are getting substantially better yields of good quality crops. He indicated, however, that there is a feeling among the technicians and farmers alike that permanent improvement in crop yields will require the development of a district-wide conservation drainage program, particularly in the Rio Grande Drainage District. If successful in this area, such a program might be extended to other portions of the valley. He pointed out that in some spots where salt accumulation is particularly high, potatoes will not make a crop at all.

The Rio Grande Drainage District has operated its drainage system successfully since 1916 and

until very recently has kept one of the most productive parts of the valley relatively free from excessive salt accumulation and high-water-table conditions. Because of its past success, the drainage system of the district will now be improved and extended by major maintenance and by replacement of structures which have deteriorated with age. The use of too much water and the lack of coordination in its use between farmers has caused much of the drainage problem.

I asked how many acres were affected with alkali in the Rio Grande Drainage District. Joe Sexton replied that a recent survey lists some 800 acres as severely affected, 10,000 acres moderately affected, and the remaining 22,200 acres slightly affected. In other words, the entire drainage district is affected to some extent, while in some localities, such as the southeast corner of the district, conditions have become quite serious.

We examined some of the fields to see first-hand the difference in crops. Oats in one field were only

about 10 inches high. The soil seemed to be more compact and the surface of the ground rather uneven, although not rough by any means. In some spots the water table was at or nearly at the surface of the ground. Light-colored spots indicated the presence of alkali in substantial quantities.

Not far away we examined another field that was being managed according to conservation plans, in which the oats were waist high. This was smooth and even. No water stood on the surface; the soil was in good state of drainage, and there was no evidence of alkali. Soil structure was favorable—without compactness. The stand of oats was quite uniform in height and density over the entire field.

These examples were enough evidence to cause me to believe that the soil conservation district officials and cooperating farmers had been able to make real progress in solving some rather difficult conservation problems, even though they seemed to feel that something further must be done over and above the work established at the time. The situation appeared to call for closer examination and study than I had been able to make at that stage in order to understand what lay back of the differences in productive capacity and what might be done about it.

The next area visited was a field where land-leveling operations had been carried out, following careful surveys by engineering and soil technicians. The surface of the soil appeared to be as flat as a table, although there was a very gentle slope in one direction. This, I was told, makes it possible to obtain uniform penetration of surface water during irrigation, preventing ponding and consequent uneven growth of crops. And this is what I would consider rather precise conservation farming, with emphasis on good water management.

Joe Sexton indicated that land leveling is one of the best ways to get better and more uniform yields. It also establishes an accurate base by which the water table can be controlled for sub-irrigation in the valley.

Subirrigation? That was something rather out of the ordinary for much of the West, it struck me. I had seen it in the Sanford, Fla., celery district where a compact sublayer served to control the water level, operating in conjunction with tiles which served the dual purpose of draining the land in wet weather and supplying needed water by subirrigation in dry spells. (See Circular 21, Bureau of Soils, U. S. Department of Agriculture, 1910.) Also, I had seen subirrigation by

water-level control with ditch gates in the drainage work of the Service in eastern South Carolina and in other parts of Florida.

Subirrigation apparently is not too widely practiced in the West because it requires a combination of soil and water conditions not usually present. "What about this practice of subirrigation?" I inquired. "Why is it so important in the San Luis Valley?"

Joe then took us to see some of the covered drains which were established, beginning back about 1916, when alkali began to give trouble. He explained how the drains were "checked" by movable gates to build up the water table during the growing season and to lower it again after the growing season when some of the excess water is carried away. Some of the drains had deteriorated and some of the checks seemed to be rather high.

When I asked why the practice was so peculiar to the San Luis Valley, the technicians indicated that the coarse, porous soils of the valley require unusually large amounts of water and this is available in the gravelly substrata which carries shallow ground-water seepage from the river and from irrigation canals within the closed basin. Where the soil or substrata is not sufficiently porous or drainage checks are not properly spaced and managed, however, the water table builds up to or very near the surface, causing damage to crops.

This seemed to explain why the San Luis Valley is so unique—the coarse, porous soil over most of the area; the high water table built up by years of seepage from streams and irrigation diversions and subirrigation; the presence of impervious substrata which prevent the natural escape of water to the Rio Grande and cause artesian conditions; the short growing season; and the ever-accumulating alkali. The only practical way to give this porous, gravel soil enough water to meet the needs of crops is to hold up the movement of ground water in the gravelly substrata by the use of mechanical "checks."

Gullies, floods, and soil washed down from eroded hills are obvious in their costly meaning and have become even more so in recent years because of the spread of soil conservation over the Nation; but here in the San Luis Valley land-damage conditions are much less evident to the eye. Here is a type of land damage going on apace because of too much or too little water in the ground and too much salt. But the effect is much the same as where erosion damage is so conspicuous—some



Proper leveling of farm land in San Luis Valley is particularly important because most of the irrigation is achieved by management of water table. SCS plans and specifications help provide uniform crop because all plant roots reach down to same depth. This typical scene is about 5 miles northwest of Monte Vista, Colo.

acreage is ruined for practical farming, much land is moderately affected in productive capacity, and all the remainder is slightly affected. All because the farmers and their local representatives have not as yet found ways and means to make full adjustment of their land- and water-use practices to the environmental limitations.

But farmers in the valley have made real progress in the last few years toward correcting some of the soil- and water-conservation problems such as: subsoiling to open up "tight" alkaline soils and subsoils and to aid in leaching out excess salts from these spots; maintaining grain stubble and, in some areas, irrigated pastures to aid in the control of wind erosion and the drift of loose soil into drainage ditches; land leveling and improvement of soil structures for better surface control of irrigation water and to provide a more precise base for manipulating the water table for effective subirrigation.

Land leveling has been practiced in this valley for many years because satisfactory growth of crops under subirrigation requires a rather even land surface in relation to the top of the shallow water table. In recent years land leveling has been increasing in the valley both as to extent and degree of accuracy. This has been made possible by the use of modern heavy equipment provided by farmers and equipment contractors and of precise measurements provided by conservation engineers and soils technicians.

All of these things are directed specifically at the water aspects of soil conservation problems and are part and parcel of well-rounded farm conservation plans worked out jointly by the landowners and water users and their locally organized and locally managed soil conservation districts, with the aid of Soil Conservation Service technicians.

This seemed to be the time for some more questions. And so I asked our conservation technicians again, "What about those problems which farmers and technicians alike feel must be tackled on a district-wide scale?"

Joe Sexton smiled and handed me a thick report prepared by Soil Conservation Service technicians, with the help of information provided by other agencies having basic water information. The report was based on careful surveys and investigations of soil, topography, geology, water, and the cropping condition and needs of the Rio Grande Drainage District. This drainage district covers the northeast quarter of the Rio Grande Soil Conservation District, almost in the center of the San Luis Valley.

But there is not sufficient space to give the details here. We shall have to look at the report itself.

VIEWED FROM HIGHEST GALLERY.—More than 200 Caldwell County, Tex., farmers recently took a look at their land from the air. Louis Bromfield, author and farmer, spoke on erosion control and soil improvement as part of the aerial conservation program. Walter W. Cardwell, manager of the Luling Foundation farm, was general chairman.

DISTRICT PROFILE

FARLEY of ARKANSAS

R. H. Farley is the grand old man of soil conservation in Arkansas. The thousand cooperators of the Greene County-Crowley Ridge Soil Conservation District revere him.

At 77, "Uncle Henry" has the double distinction of being the oldest supervisor—both in age and length of service—in the oldest soil conservation district in the State, which is among the oldest in the Nation. His appointment, dated November 19, 1937, preceded issuance of the district's certificate of organization, issued on December 7 of that year under the first soil conservation districts law enacted in the United States.

Farley's 13 years of continuous service as a supervisor is a record. The only member of the original board of supervisors still serving, he has seen the district grow from a small ridge area to cover all of Greene County.

Farley's part in Greene County agriculture began soon after his arrival in 1889. In 1896, the year of his marriage, he started farming for himself, buying 40 acres at Paragould, his home community. A few years later, he added an adjoining 40 which he cleared of timber. Over a period of years other purchases brought his land to 207 acres. When he retired in 1946 and turned operations over to his sons, he had completed a full half-century of conservation farming.

Even before the time of an organized soil conservation movement, Farley saw that something must be done or else the soils would be depleted to where farmers could not produce profitably. A conservationist at heart, he pioneered use of conservation practices in the county. He introduced the level to neighboring farmers and helped them to lay out some of their first terraces. Although those early devices were not up to present-day specifications, Farley feels they served their purpose.

"Without contour tillage or terracing, most of the steep lands on the ridge gullied and washed away in 3 to 5 years after clearing," he points out.

Ardent advocate of conservation, Farley practiced what he preached. Under the soil conserva-

tion district program, he installed a well-rounded conservation system. It included soil-improving crops, contour cultivation, crop rotations, terraces, waterways, strip cropping, gully treatment, seeding and sodding of pastures, stock ponds, woodland improvement, and fire protection. Though much of his land was practically worn out when he acquired it, conservation farming has doubled production.

Farley said that when he began farming, crops were limited to cotton, corn, some hay, and a little wheat, which farmers grew to make flour for home use.

Until after the turn of the century, there was open range for livestock in Greene County. All the cows and hogs that ran on the range were earmarked for identification. Farley recalls his brand: a crop and underbit in the left ear and a split and underbit in the right ear.

He remembers selling lint cotton for 3½ cents a pound, dressed hogs at the pole for 3½ cents, and a load of hogs on foot for as low as 2 cents. As an old-timer who questions the good of the "good old days," Uncle Henry says that to appreciate properly today's standard of living one needs only to have lived back in the time of low prices when there was "little to sell and even less to buy with." Farley prefers present figures to 3½-cent cotton and 2-cent hogs. He also prefers proved conservation practices to the hit-or-miss measures of old.

—A. J. TROXELL.

A CROP FOR THE LORD.—They are all conservation farms in the Round Grove neighborhood near De Leon, Tex. That's the secret behind the kind of church you'll find there.

The church building is made of rock and is centered in a protective grove of oak trees. It makes a pretty picture, to match the good conservation farms roundabout.

Round Grove Missionary Baptist Church was founded in 1871 by Ruben Ross. His great-great-grandson, Murray Kay, following in his footsteps, is both pastor and farmer, with his roots deep in community life.

Some time ago the congregation decided a new church building was needed. There wasn't enough money, so the church folks decided to rent 20 acres of peanut land and "raise a crop for the Lord." They donated money for fertilizer and seed. The men harvested the crop and all profits went into the building fund.

The effort paid well. At first the church had services only once a month. Now there's church every Sunday, and the congregation is busy saving up another building fund to add Sunday-school rooms.

—JOHN O. SIMPSON.



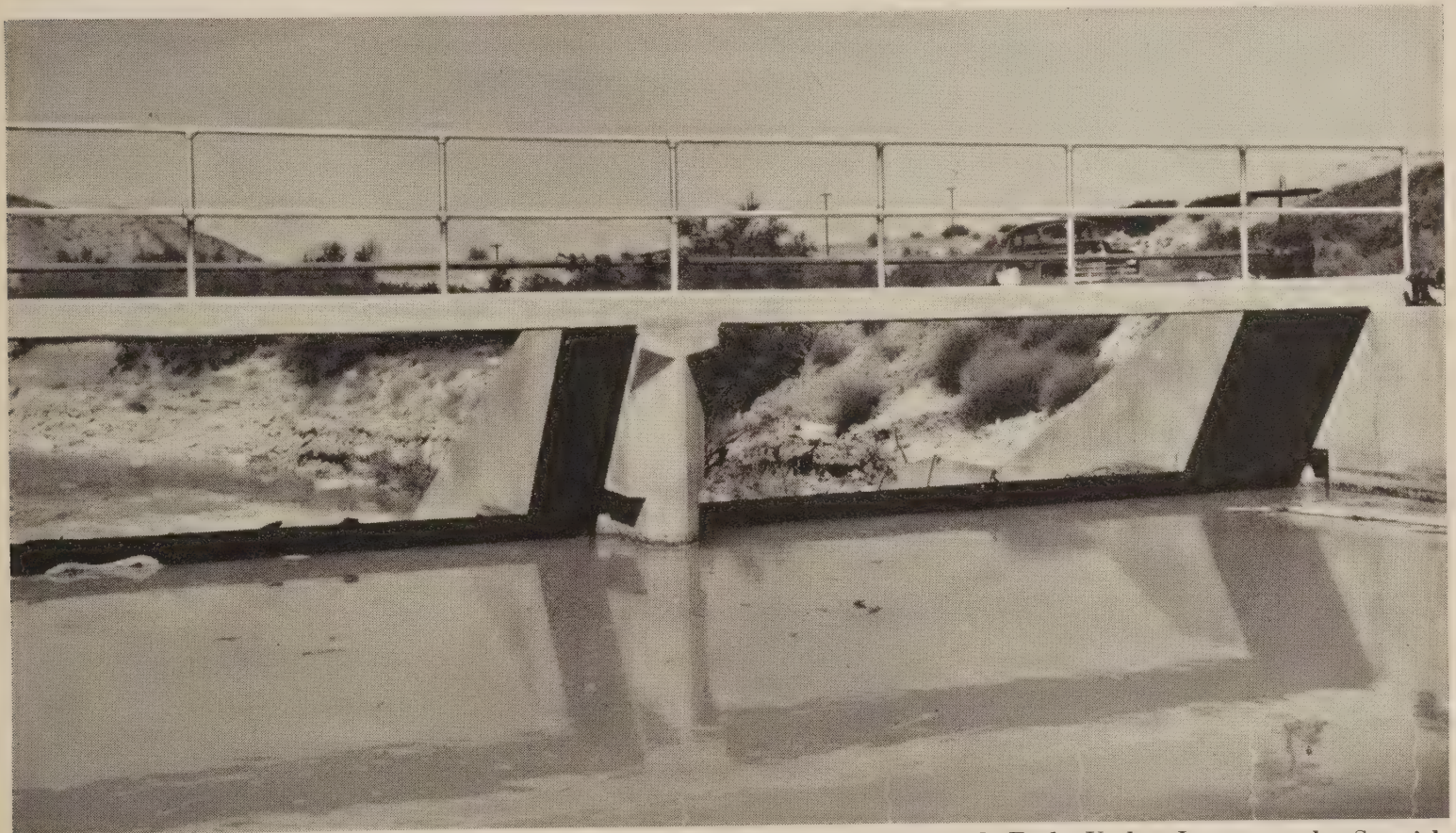
Board of Directors, East Bench Canal Co.: Ray Williams, President Joe Hansen, R. L. Jex, Secretary-Treasurer William C. Beckstrom, Reuben Gardner, Watermaster George W. Jex, and Gil Bearnson.

Better Irrigation At Lower Cost

By A. J. WEBBER

the canals were constantly filling with sand and gravel; maintenance costs were high.

"Each spring, water users kept their fingers crossed, hoping that a high flow would not take out the structure, leaving them without water for their summer crops," says Joe Hansen, president of the company. "And every spring farmers asked the board what it was doing to alleviate the problem."



New concrete diversion structure built by the East Bench Canal Co. at Spanish Fork, Utah. It crosses the Spanish Fork River in the Nebo Soil Conservation District.

FOR 25 years stockholders of the East Bench Canal Co. at Spanish Fork, Utah, pondered a problem. The condition of their diversion dam on the Spanish Fork River was becoming more precarious every year. The apron of the structure was being undercut; the timbers were old and rotting. Since sluicing operations were a thing of the past,

Actually, there wasn't much that could be done except to build a new diversion dam with sluicing facilities.

Reconstruction of the diversion was one of the first requests received by the Nebo Soil Conservation District after farmers of the area voted its formation in October 1947. SCS engineers made the surveys and drew up designs and specifications.

Completed in the spring of 1950, the concrete structure was built under contract at a cost of only

NOTE.—The author is district conservationist, Soil Conservation Service, St. George, Utah.

\$15,700. The estimate had run \$18,300. One-third of the cost was paid by the Strawberry Water Users Association, which recognized the problem created by the silt from their sluice gates 2 miles upstream. PMA payments also helped to reduce the net cost to stockholders. The actual cost per acre served was just under \$3.50.

“An inspector was kept on the job at all times on the advice of SCS engineers, and he more than earned his keep by insuring us a good job,” says Hansen.

The company recognizes that the completion of the diversion dam is only the beginning. The long-range conservation plan of the company provides for installation of many new head gates and turn-outs, realignment and regrading of main canals and laterals, and investigation of seepage losses, especially on side hills, with an eye towards reducing these losses. At the insistence of George Jex, watermaster, Parshall measuring flumes or similar measuring devices will be installed on all canals and laterals.

Jex estimates that each farmer now uses 2 acre-feet of water per acre annually. When the measuring devices are installed, each of the 186 stockholders will know exactly how much water he is using.

The company plans to coordinate its sluicing operations with those of the Strawberry Water Users group, thereby taking advantage of heavy stream flows to remove the silt, sand, and gravel in front of its own diversion.

Gravel and silt deposits in farmers' ditches are expected to be reduced to a minimum as sluicing operations become more efficient. Reduced maintenance expenses are expected to save the cost of the diversion in a few years.

A power lift to operate the radial sluicing gates will replace the hand-operated lift installed when the dam was constructed. The Strawberry Water Users group also is paying one-third of the cost of that lift plus the installation of power lines.

On the individual farm front, a high percentage of the farmers are leveling land, installing new ditches, head gates, and turn-out structures, as well as improving their irrigation methods, in cooperation with the local soil conservation district, with the aim of making more efficient use of the water delivered to them through the company's improved irrigation system.

The company, incorporated in 1878, delivers

water to approximately 4,600 acres of some of the most productive farm land in Utah County. Members of the board of directors are Joe Hansen, R. L. Jex, Reuben Gardner, Ray Williams, and Gil Bearnson.

A spring flood would have washed out the old diversion downstream, and filled the canal and lateral ditches with mud, silt, and gravel, thereby taking a year's production from the farmers. By mutual enterprise and cooperative agreement, the company has not only achieved insurance against the vagaries of excessive rainfall and unusual spring thaws, but also finds that it has developed long-range plans which will insure better irrigating streams to the farmer at lower cost.

DISTRICT PROFILE

DONALD PHARIS
of
MISSOURI

Donald Pharis retired about a year ago from the presidency of the Missouri State Association of Soil Conservation District Supervisors. As charter president Pharis saw the supervisors through a stormy 2 years. His retirement through a provision of the bylaws was really from his own choice, since it was he who insisted on a 2-year limit when the association was formed in 1947.

Pharis was committed to the principle that soil conservation districts actually should be run by farmer-elected representatives, not by professional workers. He preached the gospel that districts belong to the farmers and that unless they take time to run their own organizations they cannot be a success.

Don was born in Bates County, Mo. After graduation from the Missouri College of Agriculture in 1920 he taught vocational agriculture 14 years. His pupils speak of him as a dynamic personality, with the inspiring qualities of a great evangelist.

In 1927 Don and his wife chose a 160-acre farm near Liberty in Clay County to carry out their long ambition to become farmers. One of the first things he did was to start a soil conservation program. Some of the first terraces in the county were built in 1929 on his farm. It is all terraced now and has been farmed on the contour since 1934. Don pioneered the use of commercial fertilizer in his county and also the use of improved rotations with grass.



Don and Chief chat over coffee in the Pharos home.

Pharos was elected AAA committeeman in Clay County in 1936, and in 1941 helped with the fight for a districts enabling act for Missouri. In 1943 he helped push the act through the State legislature. With the district's program on a sound legal basis, Don was ready to talk about a district with his county farm bureau. When the district was voted in he was elected one of the supervisors and was chosen the first chairman.

Under Don's guidance, the first training meeting for supervisors was held in Springfield in September 1949. He hurried away to receive a national award for "distinguished service in conserving the Nation's resources," given by the Des Moines *Register and Tribune* and radio station WHO at their annual field day near Des Moines, Iowa. Other recipients were Kent Leavitt and Chief Hugh Bennett.

Early in the soil conservation movement Don saw the need for arousing public interest. He has helped inaugurate essay, poster, and speaking contests in the schools of Clay County. Churches in the county are urged to consider soil conservation a religious responsibility.

The Clay County Soil District supervisors in recent years have conducted an air tour over the district. Oldsters who never dreamed of riding in the clouds have looked down on the rolling fields and marveled at the conservation work which keeps the soil secure, where it can continue to contribute to the way of life that Donald Pharos always has preached and will continue to preach.

—W. H. LATHROP.

FOREIGN TECHNICIANS AT TRAINING CENTER.—

Soil conservation work brings together technicians of many backgrounds, to the mutual advantage of all. After 8 months of field experience in various parts of the United States, for example, D. G. Kelkar of India, U Aung Myint of Burma, and Julio Bran of El Salvador rounded out their training last fall by taking a 5-week course at the training center for professional soil conservationists, 13 miles north of Coshocton, Ohio.

The training center has been operated by the Upper Mississippi Region of the Soil Conservation Service for 7 years. Its purpose is to school new professional employees in the latest soil conservation methods and developments. Enrollment is drawn from Ohio, Iowa, Michigan, Wisconsin, Missouri, Minnesota, Illinois, and Indiana.

Heading the center is William H. Bender, soil scientist, who has been with the Soil Conservation Service more than 8 years. He is assisted by George Osterson, engineer, and other specialists who serve as instructors in their several fields.

Mornings are spent in classrooms, afternoons in the fields. Farms are planned, contour lines are run, soil tests are made, topographic maps prepared, each step discussed with farmers themselves. In the evenings there are round-table discussions where human relations in general and working relationships with farmers are emphasized. There is also a varied recreational program, which carries special appeal to technicians from abroad.

Saturdays frequently are devoted to field tours to nearby show places such as the Malabar Farm, the Blubaugh Farm,



At training center last fall: William H. Bender, Jr., in charge; Julio Bran, of El Salvador; D. G. Kelkar, of Baroda State, India; U Aung Myint, of Rangoon, Burma.

and the Muskingum Conservancy District.

The students and faculty are all housed, fed, entertained, and trained in one building, which is large enough to supply dormitory and other facilities for 25 students and a full complement of instructors.

Meals and housing are made available at a very small fee.

Sessions for new groups are held four times a year—spring, summer, fall, and winter.

Since its organization the center has included three or more foreign technicians in each of its sessions. To date 75 technicians, from 19 countries, have been trained here. Men have come from Greece, Palestine, Cyprus, China, India, Burma, Canada, Australia, Tanganyika, Trinidad, Colombia, Brazil, Ecuador, Peru, Chile, El Salvador, Bolivia, Costa Rica, and Mexico.

—ERNESTINE MARTINEZ.

FENCE-POST STORY.—When Bill Strayer, Franklin Township, York County (Pa.) Soil Conservation District farmer, noticed that posts in the fence separating his cropland and pasture were getting shorter and shorter above ground, he began to wonder. When he put a rule on the posts he was surprised to find the height above ground was only 2½ to 3 feet, compared with the original 5 feet. Since there had been no sawing-off, he set out to find the cause.

While walking over wheatfields and cornfields above the fence, he noticed rock exposed in several places. Then he observed that little topsoil was left. And, he recalled, he had been getting less and less production from these fields. He knew then that the missing topsoil had washed down the slope and lodged against the fence. Strayer asked the York County Soil Conservation District for help. Working with Melvin Blish, SCS technician, he developed a complete conservation plan that he is now establishing. A drainage ditch through the pasture will carry away excess surface water and some ground water. Diversion ditches and contour strips will offset the problem on the cropland slopes. With the guidance of Wayne Kile, SCS technician, he is building the diversions with his farm machinery, and has 2,000 feet completed. A contractor is handling the pasture-ditching job with heavier equipment.

“What I’m doing,” Bill says, “is taking out an insurance policy to protect me against further loss of soil, seed, and fertilizer. This will give me more production. The pasture ditching will bring more and better forage for my cows.”

DISTRICTS SWEEP HONORS.—Cooperators of the Greene County-Crowley Ridge Soil Conservation District of northeast Arkansas dominated as prize winners in Greene County’s 1950 Balanced Farming Contest. All five prizes in each division of the contest, including landowners and tenants, went to district cooperators with the exception of one third-place which was won by a farmer in an annexed part of the district where operations are not yet fully under way.

Held annually, the contest is sponsored by the Arkansas Press Association and the Farmers Home Administration.

REVIEWS

PARTNERS WITH NATURE. By Ivah Green. 112 pp. Illustrated. 1950. Scranton, Pa.: The Haddon Craftsmen, Inc. \$1.25.

This new book is for boys and girls, but it is reviewed here for the benefit of parents and teachers who select children’s books. It was written by a woman who knows boys and girls as well as she knows that conservation education is a major problem of this decade. Miss Green is State supervisor of some 5,000 one-room rural schools in Iowa. Through her work she has become thoroughly familiar with the difficulties educators are encountering as they attempt to teach conservation of natural resources to high-school and college students who have no background knowledge of such subjects. Along with many other top-line educators, she is convinced that if we want our children of today to be conservationists of the 1960’s and on, we had better see that they begin training early when all their instincts are alert to the world of Nature about them. “Partners With Nature” was planned and written for the spe-



The author.

cific purpose of helping along this important educational endeavor.

The book is so skillfully done that even the most obdurate youthful rejector of textbooks would scarcely hold out against it. The hibernating toad, bumblebees winning the Boer War, the 50,000 earthworms living in an acre of ground, the farmer and the soil and the corn kernel working together to make sugar and starch, bacteria causing dead plants to decay—all these become story characters in the child's mind. Then, the main chapter, "Help Nature By Saving Soil and Water," comes as a reasonable and natural climax to the text. The author has succeeded admirably in making soil and water "alive" and the basis of all life. It is chiefly for this reason that "Partners With Nature" is suggested as a valuable book in the home or in school for children of the 1950's—because it doesn't thrust conservation techniques at them without first giving them understanding of Nature's plan and their place in it.

Beginning with fascinating accounts of small wild creatures adapting themselves to their environment in order to keep alive, it progresses smoothly through the plant-animal-people relationship and gently glides into the consequences of destroying the balance of Nature through misuse of land and water, not only to people but to all other living creatures. With great insight into the child's mind, the author weaves into the pattern the hydrologic cycle, soil organisms, formation of plant tissues, and other scientific truths usually omitted when writing for children.

And it is a beautiful book, profusely illustrated, largely with photographs loaned by the Soil Conservation Service. In the list of acknowledgements we find three SCS regional information and education men—Adrian Fox, Albert Foster, and C. W. Gee—who, in that order, reviewed the copy for technical accuracy before printing, helped with the illustrations, and provided the Conservation Creed incorporated on pages 95-97 near the close of the final chapter.

—PHOEBE O'N. FARIS.

OUR DAILY BREAD. By Susan Myrick. 212 pp. Illustrated. 1950. Danville, Ill.: The Interstate Printers and Publishers. \$2.04.

Here is perhaps the first third-grade reader on soil and water conservation ever published. The author's thorough understanding and appreciation of man's dependence upon soil and other natural resources coupled with her skill as a writer has resulted in a book that will undoubtedly be widely used in the public schools of the South. It is now on the free list for Georgia schools.

"Our Daily Bread" aims "to teach children that everything we eat and everything we wear comes from the soil, and to give them an understanding of protecting and replenishing the soil's fertility."

The attractive cover, the 66 full-page pictures, and the large, easily read print enhance the usefulness of this book for children. The author had the help of qualified educators and conservationists. Each picture "tells a story" without having a caption. The object of each chapter is clearly set forth together with suggestions for teachers who use the book.

Sallie, the main character, learns many of the lessons about soil and plants and animals and people from her



The author, and friend. Miss Myrick is associate editor of *The Macon Telegraph* and farm editor of *The Macon Telegraph and News*.

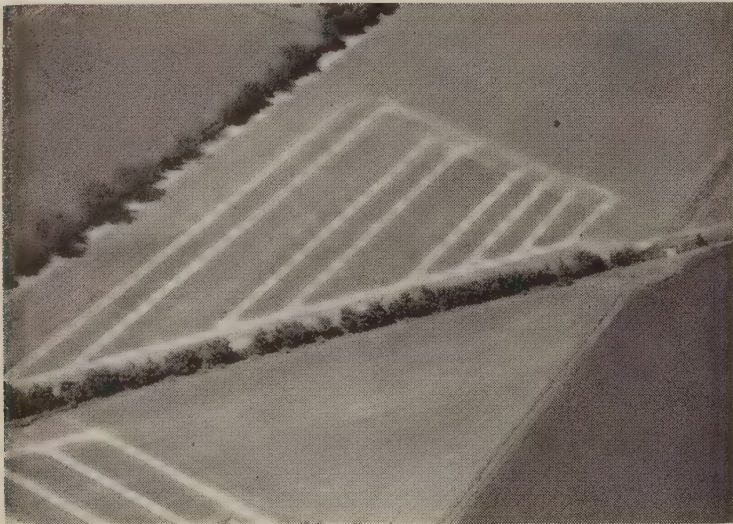
grandpa, whom she visits frequently at his farm. The text is developed so skillfully and naturally that one wonders if the author might not be writing of actual happenings of her own childhood days.

It would be almost impossible for a third-grade child to read this book without learning the same lessons that Sallie learned at the side of her grandpa on his Georgia farm.

—CAL L. ROARK.

A GOOD THOUGHT OFT REPEATED.—The Cox Chevrolet Co., of Morrilton, Ark., is helping the local soil conservation district's program by including a slogan on its letterheads: Help build Conway County by building better pastures.

NOTES FROM THE DISTRICTS



How a freshly dug tile system looks from the air. Many farmers are recording locations by photography. This "shot" is of part of the William Clelland Farm, near Hicksville, Ohio.

OHIO PIONEERS AIR-TOUR TECHNIQUE.—Soil conservation districts throughout Ohio are using the airplane to put conservation on the land. Thousands of farmers now use an airplane instead of a hay wagon or automobile as a means of transportation on tours of the land.

The airplane is gaining wide acceptance as a means of time conservation as well as soil conservation. Over one-half of the soil conservation districts in Ohio have held air tours this year and are booking dates and making plans for bigger and better air tours in 1951.

Ralph E. Young, former soil conservationist of Franklin County, is now agricultural aviation coordinator for the Ohio Aviation Board and president of the Ohio Flying Farmers. He is spearheading the program of using the airplane to put more conservation on the land.

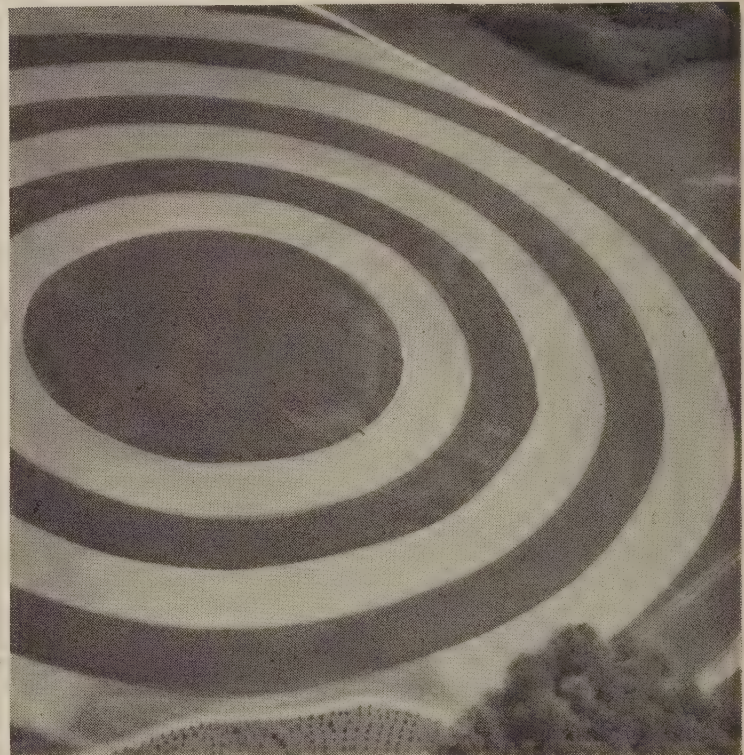
The coordinator and R. E. Burwell, of the Ohio Aviation Board, arranged to fly T. C. Kennard, State conservation-



Young Kennard Eagon Burwell

ist, and Herbert Eagon, area vice president of the Upper Mississippi Valley Region, to Milwaukee last August. They spent several days making air-tour plans for districts in the entire eight-State area. At a meeting of district supervisors, Young and Burwell set up and conducted a demonstrational soil conservation air tour, during which a study was made of Wisconsin farms. The States represented in this demonstrational air tour were Indiana, Illinois, Minnesota, Michigan, Wisconsin, Iowa, Missouri, and Ohio. The supervisors went on record as endorsing air tours, and air-touring plans were made for each State.

"There are over 800,000 soil conservation district co-operators in the United States," notes Young. A half hour spent by each over his farm or soil conservation district, flying a carefully preplanned route, will do more to develop an awareness, understanding, and acceptance of soil conservation farming than 6 months spent on the ground studying things in profile.



This bull's-eye—an exact circle—is on the farm of Mrs. Russell Lippincott and Sons. The original pattern came so close to this perfect geometrical design that the late Russell Lippincott insisted on it. Its slight variation from exact contour comes within the allowable safe margin.

PARTNERSHIP PROJECT.—Fifteen hundred acres of new land in the Huntley irrigation project near Billings, Mont., may be brought under irrigation in a few years as a result of a cooperative investigation recently launched.

This investigation deals with a problem common to irrigation projects throughout western United States: How to bring into production, areas that at present are not even furnishing grass, due to high salinity and adverse soil conditions. These areas at present are rough and covered with a scrubby growth of sage and greasewood. Soils for the most part are heavy clays with very low organic content.

In this instance, solution of this challenging problem is being sought by the combined forces of the Yellowstone Soil Conservation District, the Bureau of Reclamation, the Soil Conservation Service, the Montana experiment station, and the Huntley Irrigation District.

In the past, a few farmers have attempted to develop some of the better of these lands, with limited success. Present-day techniques, methods, and equipment, however, open a new avenue of approach to a situation which heretofore has appeared hopeless.

The increased demand for more irrigated acres of hay and pasture to provide proper balance of livestock to cash crops has spurred interest in such a study.

Actual tests are being conducted on a 17-acre plot provided by the Bureau of Reclamation. The first step in the preparation of this plot was to level the land and otherwise prepare it for irrigation. Here the Soil Conservation Service furnished the technical help and the Yellowstone Soil Conservation District did the actual dirt moving. The irrigation district will supply the water, and the experiment station will handle field operations and records.

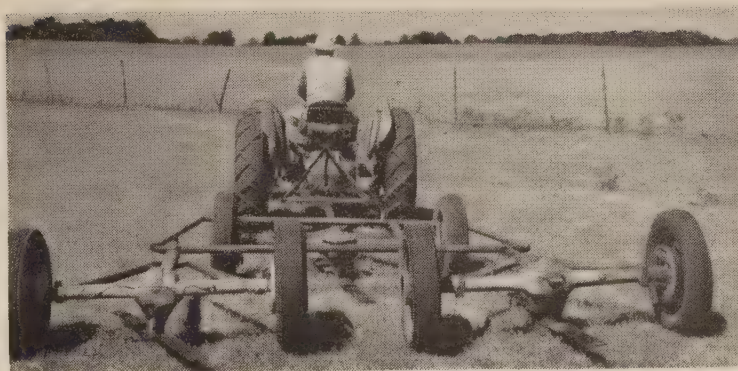
A committee consisting of representatives of all cooperating agencies is developing various treatments, rotations, and fertility tests. Reliable conclusions cannot be drawn for a period of 3 to 5 years.

If this project can determine the proper methods of handling and developing such lands, a great contribution to western irrigated agriculture will have been achieved.

PRISON FARM UNDER CONSERVATION.—Uncle Sam's Bureau of Prisons believes in practicing what Uncle Sam's Soil Conservation Service preaches. As a result of the co-operation of these organizations and the Fairfield County (Conn.) Soil Conservation District, there is improved utilization of the 400-acre reservation containing the Federal correction institution in Padanaram. In a year's time runoff water has been controlled, erosion has been reduced, condition of the soil has been improved, and production of farm crops has been boosted.

What all this means in reduced operating costs is found in a farm report showing that during the last 3 months the 114,429 pounds of food produced and used on the farm cost the Government 16 cents per man per day. This is in comparison with the purchase of 104,204 pounds of food at a cost of 26 cents per man per day, in the same period. Prior to the establishment of the conservation practices the institution rented 83 acres of land for farming. Now, no land is rented. Production this year has included vegetables for table use and canning, potatoes, milk, eggs, fruit, silage, and hay.

Establishment of conservation practices at the farm includes 32 acres of contour cropping and 47 acres of strip cropping in a rotation system (vegetables, hay, vegetables). On 51 acres, 6,700 feet of diversion terraces have been constructed. Four more acres have been improved with 1,400 feet of broad-base terraces. There are 500 feet of covered outlets. Forty acres have a winter cover crop. A pasture improvement program has been started. The complete conservation farm plan is being installed with the use of the institution's own labor and equipment.



ROTARY WEED MOWER.—Boyd Murrell and J. W. Stafford of Palestine, Tex., didn't realize they were starting something new in mowing machines when last summer they designed and built their first rotary weed mower.

It was simple: A discarded rear end of a car, a section of road-grader blade, and a trailer hitch. The blade was attached to the drive shaft and the car's rear wheels furnished power to rotate the blade.

Stafford put three of the mowers together in one frame and came up with a machine that would cut an 11-foot swath. The invention proved practical and economical. More and more farmers in the Anderson-Houston Soil Conservation District began making them. This summer there were more than 200 such weed cutters in the district.

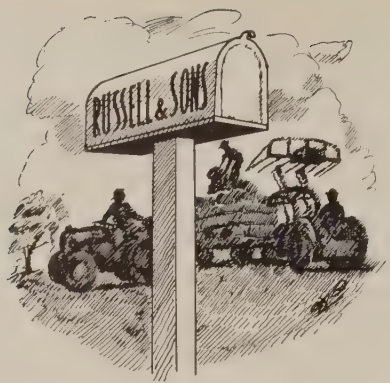
The machine which W. H. DuPuy made cost approximately \$110.

Stafford claims that he regularly mows up to 50 acres of pasture a day at a cost of only \$6 for upkeep through 2 years. That was for new blades. He claims his home-made mower gets the job done almost three times as fast as the conventional type. He likes it because it cuts weeds and sprouts without bothering grass. The machines are hitched in tandem behind the tractor or jeep when mowing pastures. But they can be towed one behind the other when being moved on the road. The blades can be inverted.

The rotary mower is gaining popularity. Neighboring districts are planning to try them. A Mississippi farmer saw one in operation and knew he'd found the answer to the problem of mowing his 800-acre pasture.

MORE FEED ON COUNTY FARM.—Expenses are lower in Windham County, Conn., as a result of soil and water conservation and good land-use undertakings. At the county farm, SCS technicians cooperating with the Windham County Soil Conservation District, have laid out and supervised installation of a system that has drained nearly 7 acres of wet land and opened the way for establishment of pasture improvement that in turn will cut down on the farm's feed bill.

Six hundred feet of main outlet ditch and 500 feet of intercepting ditches are now carrying away water that previously settled in low places and picking up water seeping from a neighboring hillside. The total cost of the job—ditching, fertilizing, and reseeding—was about \$75 per acre. This, Sheriff Lionel Poirer and Firman Hoard, SCS farm planner, say, is low when compared with the increased productive value.



EVERY ACRE PULLS ITS WEIGHT.—Young Billy Paul and Edward Russell, who live on a small dairy farm near Pittsburg in east Texas, have no desire to leave the home place. Each owns a third of the 68-acre farm. Their father, Calvin C. Russell, owns the other third.

You wouldn't think that such a small place would make a comfortable living for the seven members of the Russell family, but the Russells will assure you that they are doing pretty well.

"But we couldn't make a living on this farm the way we used to farm," the elder Russell says. "We now use every acre as it should be used and we are getting the most from it."

He indicated a 3½-acre sericea lespedeza meadow as an example. The hillside it occupies provided nothing before they worked out their soil conservation program with the aid of Soil Conservation Service men assigned to the Sulphur-Cypress Soil Conservation District. They baled 328 bales of hay from it this year.

Russell encouraged his sons to start buying an interest in the farm. The partnership is working well.

—TED CALVERT.

GEESE CUT THE GRASS.—There's an old saying about "birds of a feather." Well, this is a little story of "birds of a different feather"—one about geese helping the bobwhite quail.

Tender grass is a delicacy for a goose. For years, some farmers around Philadelphia, Miss., and elsewhere in the South have used geese to help keep cotton fields free of grass.

Bicolor lespedeza is an imported shrub that produces abundant seed that the bobwhite quail whistle about delightedly.

When Roy Goodin of Philadelphia started growing bicolor seedlings for the Mississippi State Game and Fish Commission, he found that grass was just as much a problem in the bicolor field as it was in the cotton field. So he turned his geese into the acre-and-a-half bicolor planting, as well as in 10 acres of cotton.

The result: About 225,000 bicolor plants that grew fast without grass competition. Goodin expected to receive about \$600 for the plants. The seedlings will be distributed to farmers by the Game and Fish Commission through Mississippi soil conservation districts. That means a lot of quail food in years to come.

As far as known, Goodin is the first person to use geese to control grass in bicolor seedlings. He is a cooperator with the Neshoba County Soil Conservation District, carrying

out a whole-farm conservation program worked out with help of D. McCluer of the Soil Conservation Service.

TOOK MILL TO FARMS.—How the soil conservation district program is an effective agent in developing cooperation between States and between individual farmers, increasing the farmer's annual cash income, and the development and use of new working tools is demonstrated in the wood-lot management operations.

The Southern Rhode Island Soil Conservation District had a portable sawmill and a permanent two-man crew for which it did not have full-time use. Over in neighboring Massachusetts, farmers in the Northeast Worcester Soil Conservation District had need for the services of a mill. The Rhode Island district was willing to loan both mill and crew. When 400 cooperators in the Massachusetts district were asked if they could use the outfit, 40 lined up work for it to do—enough to keep the mill and crew busy for 3 months.

An SCS forestry technician visited the 40 farms, inspected the wood lots, helped the farmers select and mark the trees for cutting, picked sites for the mill and for piling logs, and gave each farmer an estimate on cost of sawing.

In 3 months the mill and crew cut 118,299 board feet of lumber at a cost of \$2,564, about \$21 per 1,000 board feet. The largest job on any one farm was 15,000 board feet and the smallest was 979 board feet. Costs were cut when some neighbors brought their logs to a nearby mill site. Farmers paid for sawing costs in cash or by trading lumber to their district for the mill's services.

This operation effected a saving greater than in cost of sawing. For instance, trucking to and from a mill was eliminated. The farmer retained the sawdust and end slabs. Many of the logs were salvaged from land-clearing operations which, without the portable mill at hand, would have been piled and burned.

Portable mills help to get district cooperators to start wood-lot improvement programs. For example, the Rhode Island mill and crew are being brought back to the Massachusetts district for work in 1951. Response from notices to wood-lot owners indicates that the volume of business will be much larger than in 1950.



CHEAPER ON THE BIAS.—When Victor Evans bought the Blackie Gordon farm at Franklin he noticed that a lot of waste water had been running off the farm. In this area of low water supplies, waste is considered a crime.

With the aid of technicians from the Duncan Valley (Ariz.) Soil Conservation District, he conceived a plan to

keep the water at home for his own crops. He would change the direction of the irrigation runs diagonally across the field instead of straight down the slope. This reduced the grade to approximately 6 inches in 100 feet.

His first irrigation proved that it wasn't necessary to have any waste water. Every drop of water applied stayed on the field and soaked in.

He estimated the cost of irrigation by the old method at \$7 per acre. His actual cost per acre by the new method was \$3.60. In addition to this saving, his crop will be greatly increased. He explains it this way:

"Suppose I get 4 acre-feet of water each year, and 2 acre-feet run off as waste water. That means that I must raise a crop on 2 acre-feet. Now suppose I don't lose any water. The plants have 4 acre-feet for use in producing a crop. No one can argue that a better crop will not be raised with the extra 2 acre-feet of water saved."



The fire extinguished, firemen gather in their equipment and prepare to leave. Condition of shore line indicates amount of water removed.

POND STOPS FIRE.—In a strenuous 4-hour battle, firemen of Newark, Del., and Elkton, Md., successfully fought off flames that wiped out a 120- by 40-foot dairy barn and wrecked two silos. They were able to save a third newly filled silo, a large machinery shed, and other farm buildings and equipment having a total value of \$50,000 because they had a farm pond which was able to supply three continuous streams of water. The blaze started in the top of the barn, as a result of spontaneous combustion, at Ralph Vannoy's Blue Hen Farm, New London Road. It caused about \$150,000 damage by destruction of the barn, 2,500 bushels of grain, 300 tons of hay and straw, two silos, five calves, farm machinery, and dairy equipment. Eighty-five dairy cows were saved.

INFORMATION FOR CEMETERY.—Sam Wolfe answered his telephone while grabbing a bite to eat at noon. It was the local mortician calling at Gaffney, S. C., where Wolfe is work unit conservationist.

"How about getting you fellows to make a soils map of a small farm I'm buying near town?" was the gist of the

mortician's call. This didn't surprise Wolfe because the same fellow was already a cooperator of the Cherokee Soil Conservation District.

But what set him back on his heels was this added message: "You see, I'm going to convert that farm into a cemetery, and I want to know where rock might interfere with grave digging."

Wolfe left the phone shaking his head. "Is there no end to the uses people will make of land-capability maps?"

AMAZINGLY UNSURPRISING.—Out of 45 first-, second-, and third-place county winners in the annual Vermont Green Pastures Program, 37 are cooperators in soil conservation districts.

Melville Moulton, Caledonia Soil Conservation District supervisor, won first honors in the State. Fairdale Farms, managed by Robert Holden, Bennington County Soil Conservation District supervisor, placed second. Bernard Routhier, a conservation aid in the Soil Conservation Service, won honorable mention; he is a cooperator in the Essex County Soil Conservation District. Other district supervisors who were county winners are Willard Arms, first, Chittenden County; Harry Cooley, first, Orange County; George Ramsey, third, Essex County Soil Conservation District; and Leroy Kellas, third, Grand Isle County Soil Conservation District.

COUNTY PONDS.—Allegany County, N. Y., has just completed the construction of the seventeenth farm pond for the protection of Allegany County forest. The work has been done with heavy equipment of the Allegany County Soil Conservation District in which the county is a cooperator. SCS technicians planned and supervised the work.

Sites for most of the ponds were obtained by taking over tax-delinquent land. The ponds vary in size from one tenth to one surface acre, and range from 6 to 8 feet deep. Average cost was about \$310.

The ponds are for fire protection, flood control, storage of runoff in heavy storms, water for wild game, and recreation. All are stocked with fish. They are open to the public for fishing and other recreation but not for swimming.

THIS FARM CAME TO LIFE.—Walter Hadala's farm near Adams, Mass., is becoming an annual history maker. In August 1949 it made history when Massachusetts' first soil conservation face lifting attracted up to 10,000 visitors. In October 1950 Hadala, for the first time, filled his silo from production on the farm. What's more, in his haying operations he was able to save 10 days' work even though he handled twice as much hay as in former years.

Prior to the face lifting, 48 tons of hay was Hadala's maximum yield. This past year he cut 90 tons of top-quality hay. He also put away 90 tons of grass silage, 200 bushels of rye grain, and 750 bales of rye straw. When all his new meadows are established, Hadala expects to cut 150 tons of hay annually. That means he will have feed for more cows and have more milk to market.

BACK COVER

Farming in the Matanuska Valley, near Palmer, Alaska. Pioneer Peak in background. See J. H. Christ's article in this issue, "Farming in the Land of the Midnight Sun."





March 1951

Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION •

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☆ THIS MONTH ☆

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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

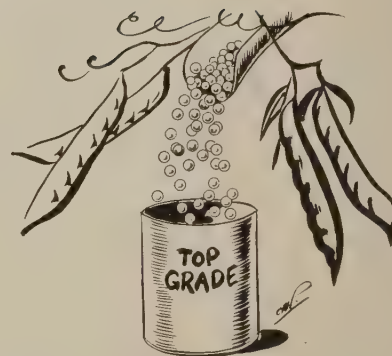
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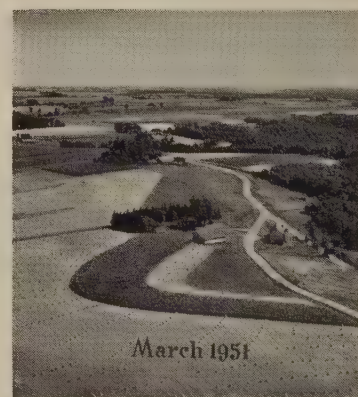


UNIFORM GRADES.—Sam Firebaugh, Shrewsbury, Pa., farmer has learned in 10 years' experience with peas, beans, corn, and other crops that it pays to plant canning crops in contour strips.

Before he started to strip crop, Sam had the disheartening experience at harvest time of having to handle three different grades of peas from rows that ran up and down the grades. In the middle sections of these fields, where a fair amount of topsoil remained, the peas were just right for canneries. At the bottom of the slopes, where topsoil from upper sections had been carried, the crop was not quite ready. At the top section, where most of the topsoil had been washed and blown away, the peas were hard and dry.

When Firebaugh became a cooperatör with the York County Soil Conservation District

(Continued on page 180)



FRONT COVER.—Floyd Waldo owns this fine conservation farm in Winona County, Minn., and John Waldo operates it. Grain strips are seeded so that in the fall, strips are in new hay with intervening strips for corn. All year round these fields are protected. Photograph by Lathrop.

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RED RYDER SAVES RUN-DOWN RANCH



RED RYDER, the famous comic-strip creation of Fred Harman of Pagosa Springs, Colo., has become a soil conservationist. This latest adventure series was started in late November and will run for around 3 months, Harman reports.

In this nationally known strip, which Harman estimates has around 30 million readers of whom half are adults, Red Ryder goes to the aid of an eastern widow who has been inveigled by the villain into using her insurance money to buy a run-

down western ranch under false pretense. As the story develops, Red Ryder and his friends, Little Beaver, Susie Jo, the Duchess and others, help the widow restore the productivity of the ranch through the use of soil and water conservation practices.

Harman is a colorful western artist who always is on the lookout for a worthy cause that can be promoted through his comic-strip characters. He became interested in soil conservation last fall,



The famous cartoonist at his drawing board.



Fred Harman examining grass on his ranch near Pagosa Springs, Colo., with his famous horse, "Thunder," just beyond the fence.

when the judging team in the finals of the Denver Post-KLZ contest visited Pagosa Springs to inspect a winning farm in the preliminary judging. In the last 3 years \$2,500 in cash prizes have been awarded to the five Colorado soil conservation districts selected as most outstanding.

The judging team, made up of L. B. Casselman, president of the Colorado Association of Soil Conservation Districts; Allen F. Kinnison, acting assistant regional director of the Soil Conservation Service; and Charles Terrell, Colorado extension conservationist, met Harman and they began discussing the value of soil conservation.

The judges emphasized the importance of bringing the soil conservation message to the children as well as the general public. The idea was conceived of making Red Ryder a soil conservationist.

The famous artist then began a close study of the soil conservation program. He held numerous

conferences with Kenneth W. Chalmers, State conservationist for the Soil Conservation Service in Colorado; A. B. Chapman, district conservationist; and Arch McCabe, unit conservationist in the Pagosa Springs area. The final result was that Red Ryder was launched on his career as a soil conservationist, and Harman became so interested in the subject that he applied to the San Juan Soil Conservation District for assistance in planning a complete soil and water conservation program for his own ranch.

CLUB ACTIVITY. — Two hundred sportsmen's clubs in the Michigan United Conservation Clubs are asked to arrange soil conservation nights when their 60,000 members will hear talks by local Soil Conservation Service representatives, county agricultural agents, and State conservation department speakers. Members are asked to invite their farmer friends.

IRRIGATION FOLLOWS A NEW COURSE IN MONTANA

By A. E. McCLYMONDS

PERHAPS the third time was the charm. But the people concerned don't think so. They're pretty sure that a new way of doing things brought success. At any rate, irrigation water was turned into the canal early in 1950, and the Hysham bench in eastern Montana became an irrigated area.

Completion of this project stands as a monument to Montana's foresight in creating a Water Conservation Board with power to act and its cooperation with the people and also that of the Soil Conservation Service and the Treasure County Soil Conservation District.

This project was developed from scratch on paper before the first spadeful of earth was turned. The soil was examined and mapped to determine the land to be irrigated, the direction of irrigation was determined for each farm so that the irrigation water would be delivered at the right place, and the drainage system was planned.

NOTE.—The author is regional director, Soil Conservation Service, Lincoln, Nebr.

This was an earnest effort to avoid the pitfalls that had been responsible for the old adage that "it takes three generations to make irrigation a success."

The Hysham Bench Project had been a dream for over 40 years. People came to and went from the area, and some of the old-timers stayed on. And the dream persisted. First proposal was in 1914 for formation of an irrigation district and floating of bonds for an irrigation supply system designed by Charles B. Taber. It was voted down. The second attempt came in 1919, with B. C. Lilles of Billings as engineer, but the proposed bond issue for this was defeated, too.

Like the present system, the first two proposals provided for pumping plants to take water from the Yellowstone River. In the essential details, the proposed canal system was like the one that was finally built. But those proposals started with the canal system; the one that succeeded started with the land to be irrigated, and a type of financing



Canal leading to main pumping plant.

that is possible only because of the existence of the Montana board.

Start of the present attempt came a little over 3 years ago when the farmers in the present irrigated area organized a Water Users Association, which applied to the State water conservation board to build the pump station and main canal system. When this was settled, they asked SCS for help in designing and constructing the lateral-ditch system and individual farm distribution system.

The reason for this line of action, according to Ray Kimball, then secretary of the association, was that these farmers had seen the type of help the Soil Conservation Service, aiding the district, had given through the development of farm conservation plans to cooperators who were irrigating. A few were near Hysham, others farther away. In fact, Kimball himself, a dairy farmer, was one of them. He was irrigating 120 acres with water pumped from the Yellowstone River, which serves another area but passes near his farm.

At the instigation of the district supervisors, the SCS marshalled enough forces in 1948 to make a complete soils survey of the area, a land-capability map, and a topographic map. With these maps available, the technicians working with the water board engineers plotted the proposed lateral and farm-irrigation system on paper and presented it to the association. The plan was accepted.

Most of the land in the area was found to fall in Classes II and III—well suited for the production of cultivated crops, but with slopes generally a little steep. Soils are good, with topsoil ranging from 12 to 16 inches thick. Except for one section of about 640 acres of heavy clay, they are generally rather light.

Little erosion has occurred, since this is an area of light precipitation, and wind erosion had been held under control. Natural drains were found to be well located for the disposal of irrigation waste water and, after some shaping, are being grassed.

Construction of supply canals and pumping stations was finished by the water board in 1949. Two stations were needed. One at the Yellowstone River, near Myers, lifts the water 58.6 feet to the lower canal. The other relifts the water approximately 42 feet to irrigate 2,000 acres. Thus, a total of 7,600 acres is served. The lower canal goes through the project. The upper, or "high line," skirts the upper edge, returning to the lower canal near the midpoint of its length.

Installation of the turn-outs to deliver the irrigation water to the farms was done precisely according to the plan as the canals were being completed. They are arranged so that each present farm has its own turn-out. Then last spring the irrigation district built the supply laterals and drop structures, as laid out by SCS. Special equipment was used to scoop out the places for the structures.

Preparation of the land, which is now progressing on the farms individually, is requiring light to moderate leveling operations. Heavy cuts needed to level land will be few.

Then the water was turned into the canals and irrigation of the Hysham bench got under way. Over one-third of the land under the project was irrigated in 1950; it is expected that two-thirds of the irrigable land will be watered by 1951. Diversification of farming enterprises has already begun, and irrigated crops were good.

"Even in 1950—first year under irrigation—we got good sugar beets and a fair wheat crop," reports Harold Zent, one of the Water Users Association directors, who, with his brother Herbert, farms quite an acreage and also is associated with his brother and father in Hysham's farm-implementation establishment.

"That's quite a difference from what the story would have been under dry farming. We would have had to raise small grain as usual and would have had a small yield. As it was, we didn't have all our eggs in one basket, and we've only started to diversify."

Kimball reported that he was able to increase his irrigated acreage by 60 acres over the 20 he formerly irrigated.

"Of course, some work has to be done on this land to put it in right shape for irrigation," he remarked, "but just getting water to it helped almost immeasurably."

His dry land is in crested wheatgrass, which is "wonderful pasture for a few weeks in spring but not much good after that." He is concentrating largely on irrigated pasture for his dairy cows. His records show, he said, that his present irrigated pasture produces a return of \$75 or more per acre.

Costs of construction of canals, laterals, structures, and pump house, and purchasing and installing the pumps averaged about \$36 per acre.

Added to these initial costs are those that the individual farmers will incur as they develop their



Intake from Yellowstone River.

farm conservation plans in cooperation with the soil conservation district. A good deal of headway was made this year, with SCS men supplying technical services for land leveling and designing the correct farm irrigation systems, along with planning other needed conservation measures.

Financing is interesting. Under an agreement with the water board, payments are being made out of production at the yearly rate of \$1.75 per acre on the cost of building canals and pumps, and an additional 25 cents per acre for building power lines to the pumps. There is no mortgage or other lien involved. Annual charges for operation and maintenance have been estimated at \$2.25 to \$2.75 per acre—in 1950 they were \$2.40. In order to protect its investment until construction charges are paid off, the water board has reserved the right to step in and take over operation of the canal set-up in case the association falls down on the job.

The present board of directors is made up of C. L. Wright, Harold Zent, L. M. Mead, Harry Mackley, and T. J. Robison, all living in or near Hysham. Lloyd Bergum of Hysham has succeeded Kimball as secretary.

Success of the Hysham Bench Irrigation Project is the result of much sober thought and investigation. The land in the area is all in established farms, and the owners had to decide whether they could assume the obligations inherent with the project development.

“It wasn’t so easy to decide as one might think,” Kimball observed. “All of us had seen some of the problems in other irrigated areas. Among these were the seepage that had occurred, the smallness of the fields that resulted from too many ditches being needed to distribute the water over a farm. We learned that often it had taken 15 years or more for successful irrigation to be developed after the system had been built.

“We also saw results of the work of the Soil Conservation Service in helping farmers who had developed farm conservation plans in cooperation with soil conservation districts. By designing proper irrigation systems they made it possible for the farmers to use their water correctly, and many of the problems seemed to disappear.

(Continued on page 187)

PROFITS FROM SOUTH JERSEY FARM WOOD LOTS

By ROY E. BALLARD

SALEM County farmers in the South Jersey (N. J.) Soil Conservation District have found a new way to increase current income from wood lots while developing a main crop of saw timber for future harvesting. They use cooperative wood-lot management and selective cutting developed by the district, the Soil Conservation Service, the State Department of Conservation and Economic Development, and the Rutgers University extension service.

This wood-lot program is based on education by the extension service and work with the farmer in his wood lot by SCS and the Department of Conservation.

NOTE.—The author is Salem County work unit leader for Soil Conservation Service, working with the South Jersey Soil Conservation District, at Salem, N. J.

Purchase of pulpwood by contractors gives the program additional impetus. Trees to be removed for pulpwood are marked by Glenn E. Smith, SCS forester, and Department of Conservation field men. In selecting trees to be removed, they are guided by the crown relationships of the dominant species that are to be retained for full development. Almost all suppressed and intermediate crown trees are removed. Some of the co-dominant, and a few of the dominant crowns, also go. Trunks on growth to be removed are marked with paint sprayed from a small hand gun.

Spacing for the trees that are retained for growth is determined by the use of a special formula: X equals $\sqrt{\frac{43560}{N}}$ — D, where D equals



Joseph Harasta wood lot before improvement cutting.



The same wood lot later on.

average diameter and N equals the number of trees per acre of dominant and co-dominant species. (It works like this: After cutting is completed, count the number of remaining trees per acre; determine average diameter of remaining trees at breast height—4½ feet; calculate square feet per tree by dividing 43,560 (number of square feet per acre) by number of trees per acre; convert to linear feet by extracting square root; subtract the average diameter of trees and you have the distance between trees). By using this formula it is found that hardwoods do best when they are spaced approximately at D plus 12 feet, and softwoods develop best when spaced at approximately D plus 8 feet.

What selective cutting means in promoting maximum tree growth is demonstrated in the photographs taken at Joseph Harasta's Lower Alloways Creek Township farm.

Kiyomi Nakamura, Pittsgrove Township farmer, near Elmer, is one of the first farmers to profit through this program. From 12 acres, mainly in pine, he sold 96 cords of pulpwood. It weighed 2 tons per cord and brought 70 cents per ton—an extra income of \$11.20 for each acre harvested. On

this farm, as an additional improvement practice, prescribed and carefully controlled burning was done immediately before the cutting for two purposes: (1) It fire-proofed the wood lot by reducing the amount of litter on the ground, and (2) it promoted the regeneration of pine seedlings by creating a more favorable mineral seedbed.

At the Jessie L. Colson farm, near Yorktown in Alloway Township, 60 acres of hardwoods were marked and sold under the same procedure. These woods netted 420 cords, an average of 7 cords per acre. The hardwoods weighed 2 1/7 tons per cord. Because of greater distance to market, than from the Nakamura farm, return to the farmer was 60 cents per ton, or \$9 per acre.

H. G. Pedrick, Jr., an Alloway Township farmer near Yorktown, reaped a \$9 per acre income from selective pulpwood cuttings on 72 acres that netted 504 cords. This crop weighed 2 1/7 tons per cord and sold for 60 cents per ton.

By removing growth suitable for pulpwood, Salem County farmers are laying the ground work for a more profitable harvest of dominant trees.

THEY HAVE A WAY WITH THE LAND

By CAL ROARK



Looking across an excellent pasture of orchardgrass and Ladino clover to the J. L. Kanagy home. The pasture carries a cow to the acre and still provides one cutting of hay each year.

AMISH farmers are noted for good farming, especially for their ability to make the land respond to careful treatment. I found no exception in J. L. Kanagy, of Stuart's Draft, in Augusta County, Va.

His 116-acre farm in the beautiful Shenandoah Valley is the kind of place that makes a city man, and most farmers, turn green with envy. It is nestled between the Blue Ridge and the Appalachian Mountains in a valley of rolling, red-brown soils. Kanagy, his 18-year-old son Ben, his 11-year-old daughter Salina, and his wife find it impossible to keep a farm long without its undergoing a transformation.

Kanagy was the first Amish farmer in Augusta County to enlist the aid of O. J. Zeigler, Soil Conservation Service technician assigned to the Shenandoah Valley Soil Conservation District. That was in 1944 after his family moved from Mifflin County, Pa., to an erosion-whipped 140-acre farm 4 miles south of their present place. Now, 24 of the 46 Amish families of Augusta County are cooperating with the district in applying complete soil and water conservation plans.

Jo Kanagy's first year in Virginia stumped him. That's when he learned what dry weather can do to crops on badly eroded land. Barley made 10 bushels to the acre, corn only 8. (Average yield, with a normal season, ran about 25 bushels of corn and 8 or 10 bushels of wheat.) "That land was so poor I didn't know what to do with it," he told me. "There were big gullies and lots of washing. Highway people were always having to haul dirt off the road that ran in front of the farm."

Kanagy sold that farm after 3 years; about one-fifth went for residential development and the remainder to his tenant, John A. Yoder. During the 3 years Kanagy owned the farm, he choked the gullies, stopped washing to where only clear or milky water ever reached the highway, boosted corn yields from 25 to 60 bushels and wheat from 10 to 30.

"The land wouldn't grow alfalfa at first, but in 3 years it was making as good a crop as could be found on any farm around here," he said. "And John Yoder is still keeping the land on the mend. He follows a district conservation plan to the letter."

Kanagy's formula for doctoring the 140-acre farm was simple but amazingly effective. He con-

NOTE.—The author is information and editorial specialist, Soil Conservation Service, Spartanburg, S. C.

tinued to use a 3-year rotation of corn, small grain, and clover with which he was familiar. He confined crops to the best-lying land on the place. Even so, sharply rolling land was the best available. SCS technicians laid out contour strips so that row crops would alternate with small grain and clover the same year in the same field.

"Having the rows on the level made a world of difference," the Amish farmer told me. "I wouldn't believe it until I saw for myself. We had to put about three-fourths of the farm in pasture and alfalfa because it was so steep or rough. This brought the land back faster than anything else. And then after we stopped the land from washing, we could afford to use fertilizer. It wouldn't wash away, you know. Each spring alfalfa and pasture got 500 pounds of 2-12-6."

As you might guess, the Kanagy family saved the barnyard manure. They added a half sack of phosphate to each load and spread it where it was needed most.

Jo Kanagy's present farm is much better than his first. The deep, rich land has gentle slopes and is rated Class I, II, and III—all suitable for rotation cropland with good treatment.

The Kanagys have made the farm productive by careful handling and heavy feeding. Ten acres of the 116 are in woods. A few acres are used for

buildings and ground. Even so, this family keeps an average of 30 milk cows, 25 heifers, 30 sheep, and 40 hogs. In addition, Mrs. Kanagy raises about 18,000 broilers each year in three batches.

Carrying capacity of the farm has just about doubled since they bought it. Last year, his pastures carried a cow to the acre and he still was able to mow once for hay. All 30 acres of permanent pasture are in orchardgrass and Ladino. "Not an acre of bluegrass on the place," he noted. He is the only livestock farmer in Augusta County who has no bluegrass pasture.

Kanagy has 18 acres of alfalfa now and expects to plant 8 more. First cutting goes for ensilage. The next three cuttings are mow-cured for hay. Kanagy was the first farmer in Augusta County to have both grass ensilage and mow-cured hay for his milk cows. Protein content of his ensilage increased from 1.5 percent with corn to 4 percent with grass. Protein content of alfalfa hay increased from 14 percent when field-cured to 18 and 20 percent when mow-cured. This amounted to a saving of 7,000 pounds of protein in feed for the milk cows.

Corn on his 4-acre patch made 121 bushels per acre in 1949. Most of his land will make 100 bushels an acre, I was told.

(Continued on page 188)



Typical of the well-ordered farm buildings. The windmill is no longer used.



Atkins views range land against background of rugged hills and fine artificial lake.

DISTRICT PROFILE

ATKINS of OKLAHOMA

The grass on the Atkins ranch in the Oklahoma Panhandle is proof enough that "Red" understands the meaning of soil and water conservation.

By reseeded abandoned cropland and by good range conservation practices, this Oklahoma rancher has brought his 9,600-acre lay-out near Hardesty in the Texas County Soil Conservation District to its present high state of productivity.

As president of the Oklahoma Association of Soil Conservation Districts, A. P. Atkins (that's Red) is official host for the 1951 meeting of the National Association of Soil Conservation Districts, on February 20-22 in Oklahoma City.

Red was reared on a farm near El Dorado, Kans. He was fresh out of Kansas State College with a degree in agriculture, and a bride, in 1924 when he went to Oklahoma to take over the piece of land near Hardesty that his father owned.

He describes the land as a "rather run-down piece of property that masqueraded as a ranch." He adds, "Since it wasn't doing any good, my father was glad to turn it over to me."

He uses purebred Hereford bulls and high-grade cows in production of commercial Hereford cattle,

and has built his ranch up to its present 9,000 acres of fine grasses and 600 acres of cropland.

Red has been president of the Oklahoma association the past 3 years and has been secretary-treasurer of his soil conservation district since its organization in 1941.

He is one of the founding fathers of the National Association of Soil Conservation Districts, having been in on the ground floor of the organization of the association back in 1946.

Red is a charter member of the Oklahoma Farm Bureau, is a thirty-second degree Mason, Oklahoma Consistory, and he belongs to India Temple of the Shrine. He is past president of the Guymon, Okla., Lions Club and chairman of the Official Board of the Guymon Methodist Church.

The Atkinses have two children, a daughter, Mrs. Richard Walden, whose husband, a Kansas State College graduate, has now taken over the farming end of the Atkins ranch, and a son, Jim, an Oklahoma A.&M. College major in veterinary medicine.

The family now lives in Guymon but Red still actively manages the ranch. He travels widely in the official capacity of president of the Oklahoma districts association and spends a big portion of his time working in the interest of soil conservation.

QUICK RETURNS.—When a conservation farm plan was established at the Hadala farm face lifting near Adams, Mass., in August 1949, many farmers wondered when the owner would start to get returns. Now they know, for in 1950 he filled his silo and some temporary silos with roughage produced on the farm. Never before had he been able to do that. Massachusetts farmers saw this and other results when they returned to the farm for a "first anniversary" inspection.

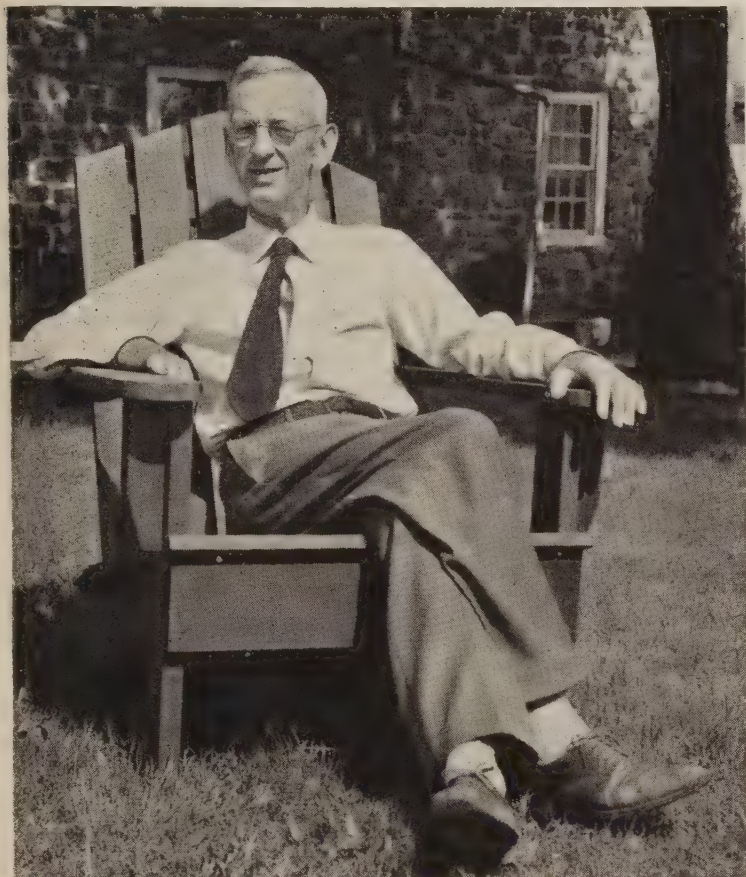
UNIFORM GRADES

(Continued from page 170)

and planted his canning crops in contour strips, he found that his troubles were over, because the top, middle, and bottom sections were in separate strips of uniform fertility. This made it easy to treat each section according to its needs and bring the three into uniform production. As a result, production from the contour strips runs about 75 percent top-grade peas. Importance of this is found in market prices. Top-grade peas bring three times the price of second-grade peas and nine times the price of third-grade peas.

DISTRICT PROFILE

FOWLER of PENNSYLVANIA



Harry K. Fowler. His stone house in background is 150 years old.

Outstanding contributions to better rural life and top-flight leadership in agriculture won for Harry K. Fowler, chairman of the Lehigh County (Pa.) Soil Conservation District, the 1950 "Page One" award of the Lehigh Valley Newspaper Guild.

In newsmen's parlance, a news story has to be very well written and very important to win a place on page one. Thus the guild's annual award for outstanding leadership in any walk of life has been set up to indicate to the public, as well as to the recipient, that working newspapermen are convinced he is a top performer.

The award, made at the guild's annual dinner, is based on a wide range of accomplishments, particularly Fowler's leadership in interesting Lehigh Valley farmers in soil conservation. Fowler, who farms 130 acres between Macungie and Alburtis, pioneered in soil conservation work in the Lehigh

Valley. Largely through his enthusiasm, the district was organized. He became its first chairman, a position he still holds.

Under Fowler's leadership, the district has become a model of cooperation. Nearly 250 farmers, with 20,000 acres, have applied complete conservation farm plans, and more than 100 others have applied for plans for more than 14,000 acres.

Harry Fowler's leadership carries special appeal to the conservation-conscious newsmen of the Lehigh Valley. The *Allentown Morning Call* and the *Allentown Evening Chronicle* have used their news and editorial columns freely to emphasize the need for more soil and water conservation and good land use. Many times this theme has been banner-headed in both newspapers by Percy Rhue and Charles W. Ettinger of the *Call*, and Nelson Weiser of the *Chronicle*.

Born in Milwaukee, Fowler entered the University of Wisconsin at a very young age. His intentions were to become a livestock farmer. City-born and city-reared, he interrupted his course to get some practical ranching experience in Colorado. From there he shifted to Denver's stockyards and then to a livestock-commission firm. Through these experiences he acquired needed background.

Delegated to take 22 carloads of cattle to Omaha, he left Denver when the cattle price was high. Two weeks later, when he arrived at Omaha with the consignment, the price had dropped so low that it would not pay off the mortgage that the owner had placed on the livestock. Then and there, Harry Fowler decided that the livestock business was not for him. Instead, he came east with his brother and they found jobs in the Allegheny orchards in West Virginia's Eastern Panhandle.

It was not the kind of farming that Harry wanted, so at the end of the season he headed north. Landing in Macungie, he met Dr. Herbert Fritsch, with whom he obtained employment that pointed the way to the kind of farming he sought.

His own desires and the advice of Dr. Fritsch sent him back to Wisconsin University to graduate with a major in agriculture. "It was the 3-year rotation system on the Fritsch farms that intrigued me," he says. Returning to the Fritsch farms for a short time, he took a year's work in economics at Cornell University.

Back to Lehigh County he came. Here he bought the 181-acre Schiffert place in lower Macungie,

(Continued on page 185)

NEW IDEA FOR SAVING TOPSOIL

By **HUGH F. EAMES**

VALUE of topsoil—70,000 cubic yards of this precious stuff—is demonstrated near Lancaster, Pa., where a highway contractor stripped it off 40 acres of a 67-acre farm, so he could remove 272,000 cubic yards of subsoil and use it for a highway fill.

Possibility of an important research study is set up because the contractor bought the 67 acres from Farmer Norman Stauffer with the stipulation by the farmer that the contractor will regrade the excavated field, restore and grade the topsoil and sell the land back to the farmer, if he wants to buy it and renew farming there. Otherwise, the topsoil

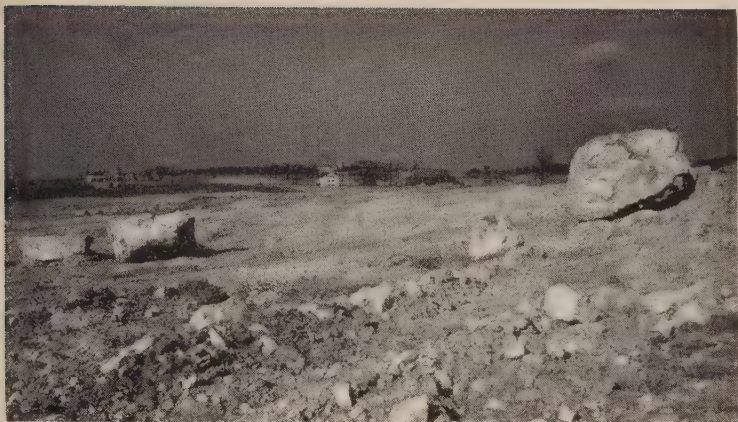
might never entirely go back to the fields, located only a few miles outside the city of Lancaster, and close to its airport. Enough might be restored to fit the 40 acres, less 2 acres taken for right-of-way, for a housing development. Remaining topsoil might then be sold for various uses. That's what is happening in a lot of big operations.

In removing the topsoil, the contractor, H. J. Williams Co., of York, Pa., rolled back an average depth of 1 foot like a rug, and piled it in three large heaps. In cutting out the subsoil, the big machines went as deep as 12 feet in some places, and to an average depth of 6 feet over the 40 acres. A dozen or more big boulders were uncovered. In over a third of the area the big machines cut down to the top of a limestone ledge. The boulders will be removed, if the fields are regraded. If the topsoil is

NOTE.—The author is head, regional current information section, Soil Conservation Service, Upper Darby, Pa.



Piles of topsoil as seen in relation to height of barn. Field between men and barn is part of the 27 acres not scalped.



Removal of topsoil uncovered huge boulders and loose stones that had broken from the limestone ledge.

restored, the new grade in the fields will be in the same direction as originally, but will be much easier. Soil scientists are much interested in what will happen if farming operations are resumed there. Among questions for which they want answers are:

1. What is the cost of removing and restoring the topsoil, and what is the cost of removing the subsoil and leveling the ground before the topsoil is restored?
2. What changes have taken place in the organic life of the topsoil while it has been in the large piles, under varying conditions of wind and weather including freezing, and how will these changes affect its productive qualities?
3. What effect will restoration of the thin layer of topsoil on the limestone ledge, or over the considerably reduced layer of subsoil, have on the moisture capacity of the fields?
4. What limitations, if any, will there be in use of the restored fields for crop-production purposes?
5. What new drainage problems will have been created?

Soil scientists say some soil may be improved by removal of unfavorable subsoil conditions, but they doubt that this will be accomplished in this instance. They are much interested in the project because of the possibilities it offers for obtaining much-needed information on problems surrounding land-leveling operations in the Northeast. These have been undertaken in a small way, and are being considered for more extensive work.

Soil scientists point out that the coming era of larger and more powerful earth-moving machines, fed with cheaper fuel—atomic power, for example—may ease the way for widespread and beneficial earth leveling. They are thinking of making new farm lands in areas where the topography is not

presently suited for agricultural operations, and where heavy equipment now available for farm work cannot be fully used until land is leveled.

They are giving much thought to the possibilities of lifting topsoil, leveling subsoil, and restoring topsoil, in relation to possibilities of leaving topsoil where it is and covering it with soil materials obtained in leveling operations elsewhere. The Lancaster project, if it develops agriculturally, may help find some of the answers to a problem that is becoming more and more acute as areas in agricultural use steadily decrease, while demand for more and more agricultural production to feed more and more people constantly expands.

PASTURE CHAMPIONS.—Three cooperators in the Berkshire (Mass.) Soil Conservation District won the highest State honors and one of them became the All-New England champion in the 1950 New England Green Pasture Contest.

R. Walter Hurlburt of Ashley Falls was first-place winner in Massachusetts as well as in the six States. Other winners were H. George Wilde of Lee and Alessio Brothers of Pittsfield. All operate under a flexible grassland-management system and each has a roughage-improvement program. All seeding mixtures and fertilizing are based on soil information obtained from the SCS land-use capability map and recommendations of the Extension Service and experiment station. They differ in their pasture programs. At Hurlburt's Hurlwood farm and the Alessio's Brattle Brook farm, fields are divided into small grazing units, 2 to 5 acres carrying 8 to 10 cows per acre. At Wilde's High Lawn farm the grass is cut and taken to the barn for immediate feeding to 170 milkers. He uses 20 acres of pasture for exercising the herd.



Registered Holsteins in mixture of Ladino clover and Reid's canarygrass seeded August '49. Before Hurlburt started conservation farming, this land was considered too wet for use.

FOUR BUSINESSMEN SUPPLY INCENTIVE

By JOHN O. SIMPSON



Foresighted men of business: Left to right—R. R. Harvey, C. M. Caraway, Jr., Harold Williams, and N. T. Haskins.

FOUR De Leon, Tex. businessmen decided they wanted to do something for soil conservation in their part of the country. The pattern was set by N. T. Haskins, president of the De Leon Peanut Co.

"I'd like to have a hand in helping put back into the soil what I've helped take away," Haskins thought to himself. He went to the telephone. He talked with three other businessmen. Fifteen minutes later \$1,000 had been donated for a soil conservation awards program. The board of supervisors of the Upper Leon Soil Conservation District gladly accepted the help.

NOTE—The author is work unit conservationist, Soil Conservation Service, De Leon, Tex.

Soil Conservation Service employees were asked to prepare score sheets and details for selecting the best conservation farmer in the district.

Haskins has lived in De Leon 35 years. He served as mayor 4 years. Under his administration De Leon began to take its place as a progressive west-Texas town.

R. R. Harvey, a leader in the conservation movement and an outstanding banker and church worker, is another backer of the program. He has lived in De Leon 52 years. He has been with the F. & M. National Bank for 45 years, is now its president.

Harold Williams has always been ready to help when his town and community needed assistance.

He is manager of Higginbotham Brothers & Co. He is sold on the value of soil conservation and was favorable to the awards idea from the start.

C. M. Caraway, Jr., grew up on Golden Oak farm. He was graduated in 1936 from Texas A. & M. College, where he studied animal husbandry. He became manager of the Golden Oak Milling Co. C. M., Jr., "inherited" conservation. His father, long a conservationist, is chairman of the Texas State Soil Conservation Board. Young Caraway was the fourth businessman of the contest group.

This quartet makes a real team.

The best conservation farmer in the district will be awarded \$500. The next best will receive \$250. Third place will get \$100. Four awards of \$25 each will be made. To the writer of the best high-school essay will go \$25, to the second best \$15, and to the third best \$10.

The awards will be presented in the spring of 1951 for 1950 conservation achievements.

The program was discussed by 30 leading farmers. They liked the idea. Here are some of the things the backers hope the project to accomplish: Stimulate conservation practices, sell conservation to those visiting the winning farms, formulate a score sheet that will be useful as a guide in the future, give the non-farmer a part in conservation, and inspire the entire district to greater accomplishments in the conservation of soil and water resources.

FOWLER OF PENNSYLVANIA

(Continued from page 181)

where he operated for 22 years. In 1930 he sold 130 acres. Four years later he bought his present farm, joining the acreage retained from the Schiffert farm. Fowler has 100 acres of contour farming, 80 acres of strip cropping, 4,000 feet of sod waterways, 1,000 feet of stream-channel improvement, 5 acres of new pasture seeding, and 15 acres of pasture management. He has removed fence rows and other obstructions, and established contour cultivation and strip cropping.

Fowler grows hybrid seed corn, raises hothouse lambs, and operates an alfalfa dehydrating plant. Recently he started raising guineas for restaurant trade.

In an area program Fowler has given leadership to a movement to establish conservation operations on the 8,000-acre Swabia Creek watershed in which

he lives. It is a long-time, slow-moving program that may get needed impetus from the currently mounting emphasis on dwindling water supplies and waste through flood ravages.

In recognition of his work achievements with hybrid seed corn, he was elected vice president of the Pennsylvania Cooperative Seed Growers Association. When the Macungie Grange was organized 36 years ago he became the first master, and continues to be one of its most active members. He is president and a member of the executive board of the Production Credit Association of Allentown, which makes short-term loans to farmers in five counties.

Fowler has written and distributed several treatises on general agricultural subjects and numerous papers on agricultural economics.

Mrs. Fowler was Jessie M. Metcalf of Mercersburg, Pa. Their son, George, is employed in Powder Valley but is toying with the idea of returning to the home farm to carry on the conservation farming started by his father.

The "Page One" award came as recognition of 40 full and fruitful years of farming—"recognition to those who make sacrifices over and above the daily routine of life; significant because it is presented by a group of appraisers within the community, who probably have the best opportunity of any group to study the greatest majority of those whose service has been outstanding . . . who are placed in nomination with dozens of others, and then balloted on by the awards committee many times until a decision is reached."

LOOKING DOWN ON THEIR OWN.—When Watson A. Luper, soil conservationist with the Jefferson County (Pa.) Soil Conservation District, addressed 35 vo-ag pupils and their teacher, William Mechlin, at the Punxsutawney High School, he suggested that they study conservation farming from the air. "It is the best way to see erosion by water, understand water patterns and controls, and observe how strip cropping hugs contours of the land. There's a lot to be learned just from seeing your own farm lay-out and the lay-out of other farms from the air," Luper said.

As a result, all pupils and the teacher took a flying trip at their own expense. An understanding pilot at the airport took them up in groups of five or six, at reduced rates, just when crop and field conditions were best for aerial studies. They flew over a 10-mile radius covering all of their home farms and many others.

REVIEWS

FORAGE AND PASTURE CROPS. By W. A. Wheeler. 752 pp. Illustrated. 1950. Toronto, New York, London: D. Van Nostrand Co., Inc. \$8.

This book is primarily a reference on the grasses and legumes grown for forage in the United States. It gives a good, clear description of their culture, special characteristics, adaptation, climatic and soil adaptation, and their usage as forage and soil-conserving crops. It is conveniently divided into four parts, each treated very extensively and completely.

Part I covers the forage crops, grasses and legumes; soils and fertilizers for forage crops; inoculation of legumes; green manure and cover crops; establishment and management of pastures; hay making; silage; improvement of forage and pasture crops; and pests that affect these crops.

Part II deals with the legumes—the true clovers, with a special chapter given to sweetclovers; lespedezas; vetches; field peas; cowpeas; soybeans; velvet beans; and birdsfoot trefoil. The final chapter discusses southern legumes most commonly used for forage and soil conservation.

Part III treats the grasses as special crops, with individual chapters on timothy, orchardgrass, the bluegrasses, brome grasses, fescues, and other minor northern forage grasses. Other chapters cover wheatgrasses; buffalograss and gramas; Great Plains grasses; southern forage grasses; sorghums, Sudan grass and Johnsongrass; and the millets.

Part IV deals with seed tables and references. Data are presented in tables on seed, nomenclature, and adaptation of grasses and legumes, with references. One of the outstanding features of this book is in the way the references are given. There are references at the end of each chapter, references by States, contribution of those in USDA, a list of miscellaneous references, and a final reference list by authors. A very complete index is given showing utilization in bold-face type for the leading subject-matter headings, and italics for scientific names.

The book is so arranged that any subject or author can be found quickly, which increases its value as a reference. It, of course, is not one on original research by the author. It is a review of

research and experiences with individual grasses and legumes, a great deal of which was obtained by direct correspondence with the research men themselves, and much was obtained by personal contact with those doing the actual research work. The book has been reviewed thoroughly by leading authorities on grasses and legumes, which greatly enhances its authenticity. In fact, each phase of the book was reviewed by competent men during the process of its writing.

I know of no one better qualified than Wheeler for the preparation and writing of such a book. He was an agronomist and seed-marketing specialist and has devoted more than a half century to seeds and forage crops.

Under the title of botanist at South Dakota State College, about 1903, he was one of the early plant breeders and forage-crop-improvement specialists. It was there that he developed the first extensive native-grass nursery in the United States with tests and space planting of western wheatgrass, buffalo-grass, the bluestems, and other native grasses. In 1904 he established the first plantings of alfalfa and brome to show the value of a legume in preventing sod binding and increasing yields and palatability. Wheeler has 9 years of commercial experience as secretary-manager of the Dakota Improved Seed Company. He came with the Department as specialist in charge of seed marketing, in 1916. He had a hand in formulating the Federal Seed Act of 1939, and in developing the Federal Reporting Service. He was chairman of the Department's interbureau committee on research concerning hay and other forage crops from 1934 to 1940. He was one of the earliest departmental authorities on the use of radio for market reports and agricultural broadcasting. He served on the Seed Supply Committee during World War I, and after the war he was sent to Europe by Secretary Houston to investigate and report on seed conditions in Europe. At the outbreak of World War II, he was drafted to take charge of Seed Procurement and Supply program of the United States. Under this assignment he developed the largest program ever undertaken for vegetable-seed production. Procurement of field seed for Lend Lease and UNRRA amounted to a total of around \$100,000,000.

At the age of 70, Wheeler still had a forward outlook on agriculture and his enthusiasm and energy kept him from retirement, in the usual sense. With this broad background in seed and for-

age-crop production, he undertook, in cooperation with the Field Institute of North America, a 4-year job of compiling the wealth of scattered information on seed and forage crops, a tremendous undertaking, both from the standpoint of work and cost. The author gives credit to the Field Seed Institute for its financial assistance which made his book possible. Credit is also given for technical assistance which he received.

Soil conservation can be achieved only through the full utilization of adapted grasses and legumes in American agriculture. The control of soil erosion must begin at the point where rain strikes the land, or where wind strikes unprotected land. Erosion control, therefore, is based upon adequate protection by vegetation. This book deals only with the herbaceous forms of vegetation which are of primary importance to our cultivated lands, pastures, and range lands. A true soil conservationist should, therefore, have a ready reference to the various grasses and legumes adapted to the United States if he is to understand fully and help apply these tools of soil and water conservation.

—GROVER F. BROWN.

FORESTRY HANDBOOK FOR THE UPPER MISSISSIPPI REGION. With a preface by Stanley S. Locke, Regional Forester, Soil Conservation Service. 101 pp. Illustrated. 1950. Washington, D. C.: Superintendent of Documents, Government Printing Office. 45 cents.

Handbooks of this type previously have been prepared for use within the Soil Conservation Service, but this—the Fifth Edition—is available to the public as a whole.

The information was assembled for the use of Service soil conservationists or farm planners, very few of whom have had formal forestry training. These men, as they develop with the farmer complete conservation farm plans, use this guide material in reaching the objective that “the farm woods should be handled in a manner similar to cropland and meadows.” The handbook furnishes in a briefed, practical arrangement the information on planting, protection, management, harvesting, and marketing that applies to the farm woodlands of that area. A wide range of research and operational findings, together with the experiences of Service field men in working with farmers, were all used in developing this publication.

This handbook is not a textbook but a working tool designed primarily for use of farm planners in helping farmers know and use their woodlands. It includes a handy appendix and index, along with sketches and diagrams. Most chapters are supported by a reference list of source material. Many foresters, as well as farmers who aim to do their own woodland work, will find this a helpful guide and reference. Although prepared for the Lake States and Upper Mississippi Valley States, it has application to many forested regions of the northeast quarter of the United States.

—C. B. MANIFOLD.

IRRIGATION

(Continued from page 175)

“We in the association made up our minds that we wanted an irrigation set-up that would succeed from the start. As a result of the help we got through the soil conservation district, we knew what land was suited for irrigation, the types of crops, and where the water should be delivered to the land before we began. Our first year’s experience with irrigation makes us think we’ve licked the old bugaboo.”

In licking it, they have also erected a landmark for all to see—the result of cooperation of a State with its people and aided by the soil conservation district and Soil Conservation Service.

“What does it mean?” Zent asked. “Well, I can tell you, from both sides of the fence—as a farmer and a businessman. For the farmers it means diversification, more and steadier income. More livestock growing and feeding. Some specialized seed crops. Wider variety of crops generally.

“But the farmer isn’t the only one to benefit. It will mean more and better business for Hysham. The town is bound to grow. There will be demand for a larger variety of goods. Not like the past days, when the demand was limited. Or like the drought periods—we had two, you know; one in the 1920’s as well as in the 1930’s—when we had to write off thousands of dollars in uncollected amounts. Irrigated areas weren’t hit by the drought.

“Yes. It means much to everyone in the community. So much, that we already have started work on a new, modern building in order to be ready to meet our share of the increased calls for new kinds of goods that have already begun.”

CROP INSURANCE IS CONSERVATION, TOO.

—The conservation idea has increasingly wide application on the American farm. For example, crop insurance to protect the farmer's investment in his annual production can contribute to a vigorous and healthy system of agriculture. A healthy and productive agricultural economy is an asset to a Nation entering a period of active defense or actual war. With such an economy, production can be expanded rapidly—the plant and facilities are available. In an agricultural economy that is not healthy and productive, much more reconstruction and delay is necessary before the needs of defense or war could be met adequately.

Farmers are said to need insurance protection of their annual investment more today than in previous years because a larger proportion of their costs are cash outlay. Mechanization and other advances in the technique of production have almost revolutionized the American farm business. This revolution involving the higher cash outlay is shown clearly by a recent study of farm records on 14 identical farms in New York over a period of 40 years, which indicates that cash expenses on these farms increased from 35 percent of cash receipts to 73 percent. This means that crop loss is more disastrous financially now than it was then. A crop loss that would reduce his income 30 percent below normal would now leave him no net income for the year, whereas, 40 years ago he would still have had considerable net income. This study also showed that these farmers 40 years ago could have lost the amount of their expenses for 12 years in succession before using up their entire capital, but now it takes only 2½ years.

This study shows the even greater need today than in the past for stabilizing factors in farm income. Crop insurance is an important stabilizing factor, just as is soil conservation. The physical protection of the farm pairs naturally with its economic protection.

THEY HAVE A WAY WITH THE LAND

(Continued from page 179)

These bumper yields of pasture, hay, and grain crops provide enough feed for all the stock except summer grazing (which Kanagy rents) for the 25 heifers. It also provides protein supplement, and feed for the broilers.

How does he make the land yield so heavily? Here's one big reason in addition to right selection of land and plants for each particular job:

Jo and Ben Kanagy plow in a lot of fertilized manure. They use about 700 pounds of commercial fertilizer to each acre. They save a load of manure a day from the cows during winter and spread it

nearly every day. In the summer, the cows leave most of this fertilizer in the pastures. During the winter the 25 heifers provide a load of manure every other day. And each year barn accumulation amounts to about 45 loads. The annual crop of 18,000 broilers also supplies a large amount of rich fertilizer. And remember, each load of manure is reinforced with a half sack of phosphate.

This Virginia family has as neat and attractive a farm as you can find anywhere. Their equipment is strictly modern, carefully maintained, entirely mechanized.

Zeigler explained to me one of the family's secrets of good farming as we drove away from Kanagy's farm: "Everybody works *including* father. They are among the first to see, accept, and put into practice the fundamental methods of good farming. They are among the most cooperative farmers I have ever worked with since I graduated from Clemson in 1918."

NOTES FROM THE DISTRICTS



THREE POINTS OF VALUE.—Albert Taylor, Kennebec County Soil Conservation District co-operator, near Sidney, Maine, gets a three-way return from irrigation in his 6-acre brome pasture. He prevents loss in milk production, reduces grain bills, and avoids feeding the next winter's hay in July and August.

He started irrigating in 1950 after he had won second honors in the county green-pasture contest. He pulls the water from the Kennebec River with a pump delivering 2 gallons a minute at 70-pound pressure. The pump, mounted on the front of a light tractor, takes its power from a pulley. Twelve sprinkler heads are supplied through aluminum pipe. They are set at 60-foot intervals, lap 40 feet, and cover an acre at a time. A 2½-hour running produces the equivalent of an inch of rain. The main supply line is a 4-inch pipe with 3-inch laterals. There is a 35-foot rise from the river, the loss in pressure being about a half pound per foot—leaving plenty at the heads.

When he started irrigating, his clay soil was hard. After 3 days he found that he could thrust a 6-inch end wrench into the soil.

GROWING INTEREST IN DISTRICTS.—Growing interest in soil conservation districts was reflected by an attendance of 35 people at a recent meeting of the board of supervisors for the Tombigbee-Warrior district in Alabama. The supervisors invited each of the seven counties in the district to send representatives of business and professional groups to enable them to get a better understanding of what soil conservation districts are, how they are organized, and how they function. Visitors included bankers, farm-equipment dealers, seed dealers, merchants, ministers, school officials, and newspapermen.

Chairman Herman Roberts discussed the district program and gave a report of the progress of the district during the 11 years it has been organized. Some of the visitors who were asked to speak were Fuller Kimbrell, farm-equipment dealer, of Fayette; Buford Boone, publisher of the *Tuscaloosa News*; Ivan Hall, cashier of the Citizens Bank of Winfield; and Dr. R. H. Tidwell of the University of Alabama. Congressman Edward DeGraffenreid was a featured speaker at a luncheon following the business meeting.

STORM HURTS, THEN HELPS.—When a rain-storm, calculated to be of 50- to 100-year intensity, did considerable damage to farm land in Maine's Aroostook potato country, it was noticed that there was considerably less damage on farms where conservation practices have been installed, than on farms without these practices. As a result, many requests for SCS technical assistance came from farmers.

LET THE CHIPS FALL!—The State Soil Conservation Committee in Maryland has purchased a wood chipper that is being loaned to the 23 soil conservation districts for use of cooperators in improving their wood lots and restoring organic matter to their soil.

MANY HELPED.—When the South Deerfield (Mass.) Water District undertook the improvement of its reservoir watershed by planting 32,000 trees obtained through cooperation with the Franklin County Soil Conservation District, it issued an emergency call to townspeople for help. Twenty-five men responded. Deerfield High School agricultural pupils gave them a lift by planting 10,000 trees. The water district commissioners served sandwiches and coffee.

\$800 SAVED.—Annually each spring, the road superintendent in Worthington, Mass., has found it necessary to do about \$800 worth of work in clearing away damage done by runoff from farm lands. Establishment of conservation farming practices, started last fall, has prevented road damage this year, even though it has been an unusually wet season, says Eben L. Shaw, road superintendent.



Gordon Davidson, president, holds charter membership certificate at organization meeting of Terrace Club.

TERRACE CLUB.—The first Terrace Club in Iowa was organized last fall at Grundy Center by 21 farmers of the Grundy County Soil Conservation District.

To be eligible a farmer must have terraces on his farm. The 21 farmers attending the organization meeting were presented special charter certificates. New members will be given regular certificates.

The purpose of the organization is to provide a means for farmers to meet and discuss their mutual terracing problems. The building of terraces with farm equipment is a relatively simple procedure.

Many problems arise in farming with terraces, however, such as plowing, planting, cultivating, harvesting corn, combining small grain, and hay making. Members believe by discussing their own individual problems they can help each other. They also plan occasionally to invite outside experts to discuss various technical problems. Moving pictures also will be used.

The Terrace Club will sponsor such events as a district-wide terracing contest.

Gordon Davidson is president; Luther Brindle, vice president; Lester Rittger, secretary-treasurer. The group plans to meet at least four times a year.

—H. HOWARD OAK.

SPEECH PRIZE.—The Dow Chemical Company will award a \$500 cash prize to the speaker representing the average-to-small farmers and ranchers of America at the 1951 NASCD convention at Oklahoma City, February 20, 21, and 22.

The subject of the talk will be, "What My Soil Conservation District Has Done For Me."



TEACHING CONSERVATION BY CAMERA.—

This is a scene during the filming of "Willing Acres," a new soil conservation motion picture by the Venard Organization, of Peoria, Ill. Keystone Steel and Wire Company are the producers. The film is dedicated to "America's farmers who would use their acres wisely." It includes scenes from farms in Georgia, South Dakota, Texas, Indiana, and Kentucky.

Although emphasis is on the conversion-to-grass angle of soil conservation, the film also brings out the fact that crops such as cotton, corn, and tobacco may also be produced profitably by the use of soil conservation practices and wise land use.

The movie tells the story of Fred Saunders, Centerville, USA, who leaves the old home place, where he lives with a married brother, because it will no longer support two families. He goes to work for a company that manufactures farm machinery and travels all over the country checking up on the company's machinery. However, Fred remains a farmer at heart and when he gets home on vacation he buys the old Gannon place, a run-down, badly eroded farm near Centerville.

The concluding scenes show Fred going over the farm with the SCS technician assigned to the local soil conservation district, the county agent, and Jim Hawkins, banker, who lends Fred the money to buy the farm. Fred marries Mary Westcott, the sweetheart whom he had never felt financially able to wed.

This is the second soil conservation film to be produced by Venard Organization, which several years ago made "The People Together," a motion picture sponsored by Sears Roebuck.

SEVEN YEARS OF PROGRESS.—It was a poor place that O. E. Brower owned, near Flowell, Utah, with a remodeled shack as a home, but he was rich in ideas.

Of the 80-acre farm, not more than 20 acres were productive. The farm was in need of new fences, land leveling, more water, an overnight pond for storing water, better pasture, more fertilizer, and most everything that goes into making a farm profitable. Its light loam soil sifted through the cracks of his shack when a breeze stirred.

Although the buildings needed repair, Brower, with the help of his family, was a potentially good poultry manager. The Soil Conservation Service representative working with the Millard Soil Conservation District made a recommendation for a loan to buy 3,000 turkeys. The fowls could pasture on the marginal land and would be an immediate means of increasing the farm income.

The Farmers Home Administration made the loan. The turkey enterprise proved successful, starting the family off on a real conservation program.

The next step was the development of water from three inactive wells. They were at the highest point

of elevation. They had flowed in the past, but due to the lowering water table, the water now stood 8 feet below the surface. The SCS dragline was used to dig a trench 15 feet deep at the wells and at 600 feet west came out at ground level. A concrete pipeline was installed in the trench and connected to the wells. The wells now supply additional water to the farm.

Two overnight ponds were constructed and the artesian wells were piped to the ponds, giving the farm an adequate supply of water for the irrigated pasture recommended in the farm plan.

In the past 7 years, Brower has practiced conservation and used better farming methods. Visiting the farm today, one will find a modern Grade A dairy, a herd of 40 high-producing milk cows, a new modern home, a new automobile, and irrigated pasture.

LAST LINK IN CHAIN.—The two hundredth conservation plan has just been approved by the supervisors of the Dakota County (Minn.) Soil Conservation District. The plan covers the 200 acres owned by Louis Bruder in Rosemount and Inver Grove Townships, about 8 miles south of South St. Paul.

The Bruder plan, in addition to being the two hundredth in the district, is also important because it adds the last link in a 2½-mile chain of conservation farming between two farms first planned in 1945.

Farm plan number 7 was made for the farm owned by the late Alex Maltley. His farm is located south of South St. Paul and extends down to the Mississippi River. Maltley's son Harold has been operating the farm and has done an excellent job of conservation.

Farm plan number 13 was worked out with Peter Transberg during the winter of 1945. The Transberg farm is located in Rosemount Township, north of the Gopher Ordinance Works.

The neighbors of Alex and Peter watched the results, and after harvest in 1945 Arthur Letz, Alex's neighbor, had his farm planned. In 1946 Winifred Horrisberger, a neighbor of Peter, had his farm planned. Conservation farming in the two neighborhoods spread gradually until finally they were joined with the Bruder plan. There are 13 farms in the group, with a total of 2,093 acres. Big gullies have been closed and seeded. Steep land has been taken out of cultivation and seeded for pasture. Pastures were improved and crop rotations followed. Trees were planted and terraces were built. In all, 329 acres were planned for contour cultivation. To date, 293 acres have been farmed that way. A total of 361 acres were planned for contour strips and 292 acres have been established.

Peter Transberg was named the outstanding soil conservation farmer in the Dakota County Soil

Conservation District in 1947 by the district supervisors. This year the supervisors selected M. F. Swanson, Peter's next-door neighbor, as one of the three best conservation farmers in the district.

—LEE K. MOORE.

VIRTUALLY COMPLETE.—Addition of about 156,600 acres in Randolph County, W. Va., to Tygart's Valley Soil Conservation District has brought all of West Virginia, except two magisterial districts in Randolph County, into district organizations.

SOUNDS SENSIBLE.—The Keokuk County (Iowa) Soil Conservation District governing body has decided to invite new cooperators to attend the commissioners meeting when the cooperators' farm plans come up for approval. Many districts are following this procedure and the practice is becoming widespread in Iowa.



GUARDIANS OF THE FIELDS.—Wilbur Siereks near Landa, N. Dak., a cooperator with the Turtle Mountain Soil Conservation District, planted his ½-mile windbreak to help protect his land and crops from wind damage, but trees have so many other values that the original purpose seems incidental.

“For example,” he said, “during the 1948-49 winter, when this country was snow-bound for so long, I could travel a half mile east and a half mile west, but most of the time, no farther.

“A lot of money was spent trying to keep roads open that winter, but without success. But not a nickel was spent on this stretch of road protected by the trees and it was open all of the time.

“The windbreak keeps the farmyard and feed lots open, too. Besides that, it makes things more comfortable in the house and in the yard when a cold winter wind is blowing.

“Then there are all those plums, sand cherries, and chokecherries that the windbreak produces—more than enough for both our family and the birds. We have them as fresh fruit and in jams and jellies.

“In summer they attract a lot of birds. Their chirping and singing makes things a lot more pleasant, and many of them live principally on the kind of insects we don't want around.”

A Year of Responsibility and Opportunity

The following message was sent to all employees of the Soil Conservation Service:

Just a few years ago we all celebrated the victorious ending of a war. All of us hoped that it might be the last fighting between nations. We fought to preserve our liberty against the ambitions of men in other nations who wanted to impose absolute dictatorship over our thoughts, our actions, and our aspirations. We fought, as thousands of Americans had fought before—since Colonial days—to preserve our right to govern ourselves, as the majority of us saw fit, without coercion, reprisals, or acts of violence to ourselves and our families.

Now our country is faced with another emergency. An alien system—one that is completely opposed to self-government and the freedom of the individual—is in action against us. You know what is happening in Korea and at the meetings of the United Nations. You know that General Eisenhower has had to return to uniform. You have heard or read what the President and our leaders in Congress have said about the gravity of the present situation.

Once again we are confronted with the imperative need to defend ourselves, our liberty, and everything that Americans hold dear.

There is no time for debate—*American men are in action now*, as they were yesterday and will be tomorrow.

No one knows how long the present emergency may last or what proportions it may reach. But we do know that we must prepare ourselves for any development. To meet the increased requirements of ourselves and our allies we are going to need greater production of food, fiber, vegetable fats and oils, and wood products—all of which come from the soil. The surest way of increasing production and holding it at the necessary high levels, year after year for as long as may be required, is by sound conservation farming over wide areas. Along with the cooperating farmers in soil conservation districts all over the country, we in the Soil Conservation Service demonstrated the value of conservation farming during the last war. Wisely planned and carefully applied systems of conservation farming not only resulted in large increases in production but protected the land at the same time. Farmers and ranchers were able to get larger yields with less labor, equipment, and fertilizer.

In war, as in peace, the land continues as our most vital and basic resource. Everything we do, all we share, and whatever we amount to as a great and vigorous people, begins with and rests on the sustained productivity of our agricultural lands. Any undermining of this base undermines and weakens our Nation and all of its people. So during the year ahead—1951—you have a greater responsibility and a greater opportunity than ever before. Soil conservation work must be speeded up. Once again it becomes an indispensable part of the basic defense operations of the Nation. And you and your job, important in peace time, now become doubly important to the Nation as it begins mobilizing for the emergency with every resource we possess. What you are able to accomplish this year will not only bring results this year, but next year, and on into 1955 and 1960 when the need may be even greater.

We in the Soil Conservation Service have an unusual and indispensable service to give to the country. We have the knowledge and the experience necessary to work with farmers and ranchers on the land to protect it, use it wisely, and make it yield more—year after year. In our work with soil conservation districts we are also helping to build and strengthen the American system of self-government at the very sustaining foundation.

Our land, our liberty, our self-respect, and our system of self-government—these are what we have fought for in the past and are determined to protect in the future. Every man in the Soil Conservation Service can help and help best by studying his job, sticking to it, and putting even more of his enthusiasm and determination into it than ever before. For my part, I will be working with you and for you to the best of my ability all the way.

—H. H. BENNETT.



APRIL 1951

Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION •

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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A NEW WORK FOR THE CHURCH.—

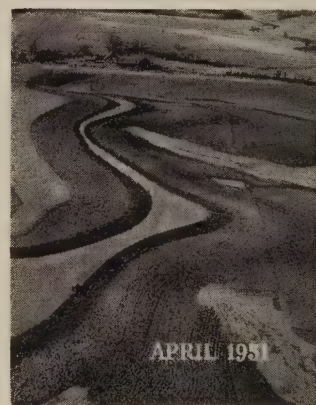
The work unit conservationist in the Morgan County (Ill.) Soil Conservation District recently received the following letter:

Dear Mr. Pierce:

I have assumed the pastoral care of Grace Chapel Methodist Church in Township 16. I am wondering if there isn't something we can do on a neighborhood basis to further your program. I hope to use the church as a center and stimulus for such work. Please let me know if there is anything we can do.

Sincerely

Robert Pitch

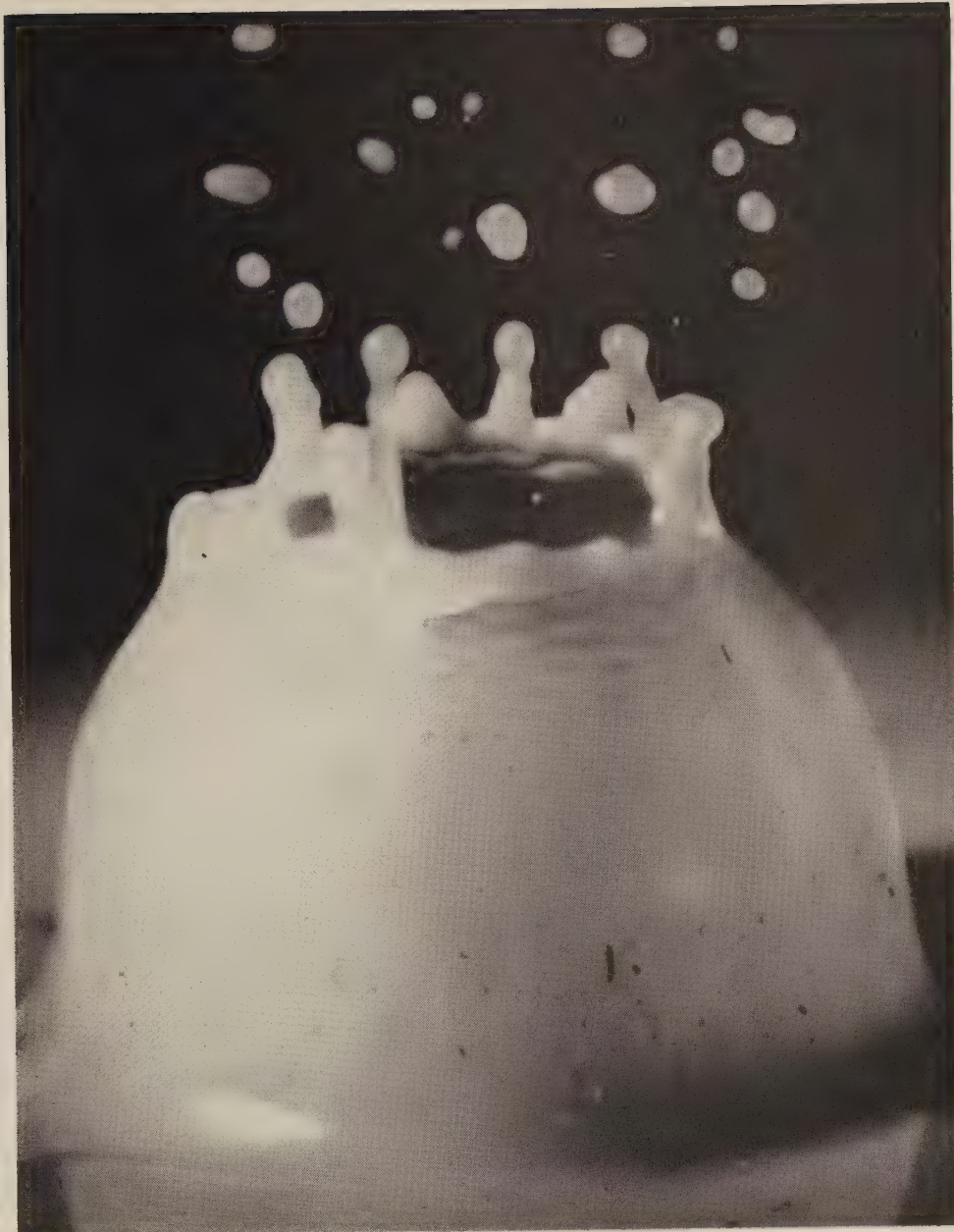


FRONT COVER.—Don Ultang, photographer for the *Des Moines (Iowa) Register and Tribune*, provides this excellent picture of contour strips being plowed in a pasture on the farm of Ralph Ogan, near Searsboro, Iowa. Besides being a striking picture of this operation, the photograph also shows many of the problems that arise in this work, and so is good from the how-to-do-it standpoint. It shows "skipping" of waterways, how irregular-width strips are handled, and how turn lands are left for easier handling of large machinery.

BOMB SHELTERS FOR THE LAND!

By BEN OSBORN

Explosive effect of raindrop striking flooded soil.



TEXAS is looking to the defense of its range lands against bombardment by raindrops. Results of a recent survey of the soil-protective values of range cover provide new information as to requirements for sheltering grazing lands.

From the conservationist's viewpoint, each little drop that strikes bare earth splatters and blasts away at the soil like a miniature bomb. And there are millions upon millions of drops in a single rain. Their total effect, if uncontrolled, can lead to serious soil damage. "Bomb shelters" for the land are as necessary a part of our national defense as bomb shelters for city populations.

Note.—The author is a soil conservationist, Soil Conservation Service, San Angelo, Tex., and was leader of the field party making range-cover evaluations with the raindrop applicator. The operations and research branches of the Service cooperated in the work under the direction of Louis P. Merrill, regional director, Fort Worth, and Charles J. Whitfield, project supervisor, Amarillo Conservation Experiment Station, Amarillo.

Plant cover is the land's principal shield against the raindrop's blasting action. On range lands this means grass and the litter that remains from the previous year's growth. But how much grass cover is a safe minimum for soil protection? How effective are range covers as they exist under current ranching practices?

For the past 2 years soil conservationists in the Western Gulf Region have been testing different kinds and amounts of cover in principal range areas. A field party was equipped with a "rain-drop applicator" capable of bombarding the ground with a force similar to the beating of the hardest rains. They traveled the highways and the cattle and sheep trails of western Texas at all seasons. They measured soil splash and water losses from typical examples of major range soils and calculated the relative efficiency of the cover.

The poorest was tested along with the best, the overgrazed compared with the protected.

Results from 163 plots, representing 12 major range sites in 7 problem areas have been summarized. They show at once the inadequacies and the strength of Texas' grazing land defenses. Under the pelting of the test application of water, bare and poorly covered areas suffered from excessive soil splash and high runoff. Other plots with adequate cover on the same soils suffered negligible losses.

The exacting tests demonstrated that cover on the land will prevent one important initial factor in soil erosion—dispersal of the particles by raindrop impact. They showed every range site tested was capable of growing under natural field conditions sufficient cover to protect itself from appreciable damage by raindrop bombardment. From these results emerges a new picture of the cover requirements of range land.

To get at the problem where it exists on range lands, the apparatus had to be taken out of the

laboratory into the hills and valleys and onto the plains of remote ranches. This the Texas conservationists have done. They have devised a mobile unit mounted on a truck which can be taken practically anywhere that such a vehicle can be driven.

The equipment to apply raindrops of controlled size and velocity to range plots was tested at the Amarillo Conservation Experiment Station. Though unwieldy and laborious to operate, this equipment showed that protective values of range cover could be measured under field conditions and indicated the important results to be obtained. C. J. Whitfield, technical adviser, and B. W. Allred, regional range conservationist, planned and organized a field survey of range-cover effectiveness.

From this beginning Paul M. Browning, equipment engineer of the Western Gulf regional staff, designed the current model of raindrop applicator. This consists of a set of pressure tanks mounted on a truck, with a small gasoline motor and compressor to force water through a hose to the top of an enclosed tower. Here it is sprayed through a



The mud flies under impact of raindrop.



Mobile raindrop applicator in operation on western Texas range.

nozzle onto a circular drip screen where the drops form on the ends of short pieces of yarn and fall to the ground 14 feet below. The size of the yarn drippers controls the size of the drops. The drop size and distance of fall determine the velocity or force of impact on the soil.

Two inches of water applied through this apparatus in 20 minutes strikes the ground with sufficient force to dislodge soil at a rate comparable to natural rainfall. The soil splash measured in the field is rated against a standard material of uniform structure—a clean fine sand. Different soils vary in ease of dispersal. Samples from each plot are compared with the sand standard and results of the tests are adjusted according to their relative ratings.

By applying the same amount of water to a series of plots on the same soil, having different kinds or amounts of cover, and comparing the amounts of soil splash and water lost, the effects of the cover can be evaluated. After adjusting for variations in the soil, effectiveness of the cover can be expressed as the percentage by which it reduces splash from what would occur on bare soil. Comparison of the water caught from the plot with the amount applied reveals the extent to which

rainfall is absorbed under different conditions of cover.

Soil splash from bare range soils in the tests varied from 2 to 20 times as much from some soils as from others, due to differences in soil type and physical and biological conditions of the soils. Despite the wide range in performance of the soils, examples of cover were found on every site which were 98 percent to 100 percent effective in preventing soil splash.

Through the wide range of covers tested, the effectiveness of the cover in reducing splash was consistently proportional to its amount, up to the point where complete protection was provided. Beyond that point additional cover, of course, could have no effect.

Amount of cover on the ground was more important than kind in protecting soil from raindrop impact. Although there was some variation between plants of different growth habits, these differences were mainly due to different capacities to produce volume of cover.

Soil-protective value depends upon both the weight of the cover and the completeness of the coverage; i.e., upon the mass available to absorb the impact force of the rain and the thoroughness with which the soil surface is protected from direct impact of the drops. However, since these two properties of cover—weight and density—are closely associated, effectiveness was found to be well correlated with measurements of either. Since weight of cover can be determined directly by clipping and weighing, or can be estimated with reasonable accuracy, results of the splash tests were summarized in a curve showing the relationship between effectiveness and weight of cover.

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Telescoping tower facilities moving equipment from plot to plot.

PRESS AND RADIO JOIN FORCES IN SUPPORT OF CONTEST

By HUGH H. BENNETT

IN 1950, for the third straight year, the Denver Post and radio station KLZ awarded \$2,500 in cash prizes, plaques, and scrolls for outstanding soil and water conservation accomplishments in Colorado. The five top districts won \$500 and plaques, while the three individual farmers or ranchers representing the winning districts received scrolls.

The unusual aspect, to me, is the fact that two organizations which might be expected to be keen competitors have found it practical and worth while to cooperate in this enterprise for the general welfare of the State.

Rules of the contest, as worked out by representatives of the newspaper, the radio station, and the Soil Conservation Service, are different from anything I have heard of anywhere else.

First, activities of the district boards of supervisors are made all-important; supervisors must assume and maintain a position of direction and leadership in order to be eligible to win. This undoubtedly is the most important point of the contest. Through stressing activities of the district supervisors, the contest has been brought to the attention of all landowners and operators in the State. These custodians of the soil are coming to realize that they must exercise their rights as individual citizens if they are to have an effectively operating district.

Second in importance is the quality, quantity, and completeness of work done on the three farms or ranches selected by the supervisors to represent their district in the contest. In this connection the effectiveness of the conservation program, the interest of the individual, and what he has accomplished are considered in the judging. It is interesting, to note that consideration is not given to the actual quantity of work done, but rather to the resources available to the individual and how much he has accomplished with them.

For example, in the first year of the contest in 1948, there was a winner in the San Juan district who spent not more than \$50 to \$75 in getting the

conservation program on his land. He had been so short of cash that he had done all the work by himself with teams, scrapers, slips, and whatever else was available to him. Nevertheless, this farmer had used everything available to him in getting conservation practices on his land and was adjudged a winner.

The Denver Post-KLZ contest divides the State into various regions. There are two regions in the Platte Valley, three in the Arkansas, one in the San Juan Basin, one in the Rio Grande Basin, one on the Uncompahgre-Gunnison Drainage in the vicinity of Montrose, one on the Colorado River in the vicinity of Grand Junction, and one on the White-Yampa River in the vicinity of Craig.

Each district desiring to enter the contest sends its entry to the Denver Post or to Station KLZ, along with the names of the three farmers or ranchers who will represent the district. After the contest closes early in July, the judges determine the winners in each region. Regional judging teams are composed of a district conservationist, a banker, a director of the State Association of Soil Conservation Districts, and a county agricultural agent. Exactly the same judging system is used in the regional and final judgments.

When the regional winners are determined, the State judges then select the five top districts. The State judging team is made up of an SCS State conservationist from outside Colorado, the president of the State Association of Soil Conservation Districts, and a representative of the Extension Service at the State level. These judges are accompanied by representatives of the Denver Post and KLZ, who take pictures and prepare news articles and radio programs for publicity continuing throughout the contest judging.

In addition to the benefits accruing to the actual participants, the contest points up the effectiveness of districts and what they can do toward using both public and private facilities to conserve the natural resources of the State. Businessmen have definitely been brought into the picture. This is

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Four hundred farmers and ranchers listen in shade of live oaks to talks on range conservation.

CROWDS ARE MADE UP OF CLUSTERS

By **HOWARD W. REAM** and **G. M. MORRIS**

HAVE you ever noticed how people cluster in small groups before or after a meeting or whenever there is a break in a discussion? Undoubtedly you have, but perhaps you have thought little about the significance of these little natural groups.

Recently E. J. Hughes, assistant State conservationist in Texas, made an observation that attaches considerable importance to what takes place in these little clusters of people. This observation was a result of some pictures taken at a district-sponsored meeting on the Arthur Blaschke ranch.

Note.—The authors are, respectively, soil conservationist, Soil Conservation Service, Washington, D. C., and chief, regional project plans division, Soil Conservation Service, Fort Worth, Tex.

About 400 ranchers and farmers from several soil conservation districts attended.

The meeting started with a general discussion of range problems and the need for proper grazing management. A tour was then made over the ranch to study the vegetation on overgrazed sites as contrasted with others well managed. Pictures were taken at each of the stops. After the pictures were developed, Hughes noticed how the people collected in small groups at each new location. Some of the same people bunched together each time. Closer examination revealed that in each of these little clusters were folks who belonged to the same neighbor group. These neighbor groups had previously been located and had worked together on soil conservation activities.

The term “neighbor groups” may be new to you. It is one which the Soil Conservation Service has used to designate the smallest natural grouping of people next to the family. It is made up of families bound together by certain customs, traditions, religious beliefs, national background, likes, interests, and needs. Each family is to some extent influenced by other families. They often visit each other, help each other in times of sickness and distress, borrow and lend farm equipment and household items, and sometimes exchange labor and share the ownership of machinery. They often



The gathering moves to another location. The clusters—natural neighbor groups—are shown here in brackets.

link up for social and recreational activities. The neighbor group, then, is a group characterized by the many friendly, intimate, and personal contacts. It is the group in which the folks look upon each other as “good neighbors.” These groups are small, usually running from 5 to 12 families, seldom less than 5, rarely more than 12.

Neighbor groups are not to be confused with “neighborhoods” or “communities.” These are generally of larger size, and in them people are less likely to know each other personally.

Because of their peculiar characteristics, neighbor groups afford the most logical and natural way in which to work with people in soil conservation. For the most part their meetings are informal. You, doubtless, have observed such informal gatherings on street corners, at auctions, at sales, at the crossroads store. In such huddles, people discuss things more freely and participate more actively in projects of mutual interest than at large meetings where they don’t know most of

(Continued on page 212)



Here, at a third stop, made to study a well-managed range site, the groupings are still more sharply differentiated. The lone figure in foreground either has not found his usual companions or is an “outgroup.”

GETTING READY TO TAKE OVER

By JOSEPH COOK

THERE'S a rapidly growing group of boys in Cayuga County, N. Y., who can talk about farm plans and conservation practices on even terms with the professional. Sixteen youngsters who belong to the recently organized Port Byron and Union Springs FFA-4H Soil Conservation Clubs have demonstrated they know and also practice what they're talking about.

For their progress in establishing soil and water conservation measures on their parents' farms last year, two of the boys, Carl Pearce and John Young, won county championships. Young, "B" Division (under age 15) winner, went on to take the New York State 4-H contest crown—and a \$25 U. S. Savings Bond.

The idea of soil conservation clubs for farm boys popped out during a conference between the work unit man of the Cayuga County Soil Conservation District and Ed Winchester, county 4-H agent. It seemed worth trying out on Carl Stevens and Allan Shotwell, local vo-ag teachers. They immediately saw the project's value and started integrating it with the school work at Union Springs and Port Byron.

Each boy prepared a map of his home farm showing how it was actually being used at the moment. Then, with a land-use capability map supplied by the local work unit conservationist, the boys drew maps showing how they thought the farm should be worked to conserve soil and water. They were encouraged to seek advice from their parents, their FFA and 4-H advisers, and the SCS man. They made final decisions themselves.

Complete establishment of three approved conservation practices was the minimum requirement for youngsters who wanted to qualify for a finished project.

As a result, Cayuga County farm land took on a new, improved look in many places. The boys' enthusiastic and creditable efforts attracted the attention of the local soil conservation district directors. Farm banking institutions, broadcasters,

and prominent conservationists offered encouragement.

At the end of months of planning and hard work on practices such as contour strip cropping, diversion ditching, and terracing, the boys had plenty to show. Their parents, advisers, and friends had reason to be proud of them. They staged a banquet to honor charter members of the first FFA-4H Soil Conservation Club in the Empire State.

Prominent in paying tribute to the young conservation farmers at the festivities were Ed Winchester, county 4-H agent; Bob Doubleday, well-known farm broadcaster; Irving B. Stafford, State conservationist; Edward Ramsey, farm-banking representative; and Hugh Wilson, extension conservationist, jointly employed by Cornell University and the Soil Conservation Service.

All who participated in the project were presented Certificates of Merit by Joseph Cook, Cayuga County work unit conservationist. Members of the Port Byron club, guided by Carl Stevens, vo-ag teacher, were Guy Ball, Wesley Bobbett, Fred Edmunds, Richard Dutcher, George Mills, Franklin Roberts, Earl Snyder, and Marvin Wilson. The Union Springs club, led by Allan Shotwell, was composed of Robert Colbert, Roy Gans, John Girndt, Carl Pearce, Robert Sanders, Julian Stachniewicz, Richard Thurston, and John Young.

Both clubs have already started on this year's program. And the idea has spread to nearby Weedsport where Howard Finley, vo-ag teacher, intends to launch a similar club.

Those who have seen what the Cayuga County FFA-4H junior conservationists have done, hope the idea will keep right on spreading. It's good for the land—and for the boys.

BACK TO SOIL THANKSGIVING.—A Thanksgiving program, based on soil and soil products, was presented last November by churches of De Funiak Springs, Fla. State and Federal agencies took part. An unusual feature was the presentation of a tray of soil in which various seeds were planted. Products of the soil of Choctawhatchee River district were displayed.

Note.—The author is work unit conservationist, Soil Conservation Service, Cayuga County, N. Y.

THE DISTRICTS AND NATIONAL DEFENSE

By SENATOR ALLEN J. ELLENDER

The following address by Allen J. Ellender was recorded in Washington as a message to soil conservation district supervisors everywhere, and was first delivered by transcription at the annual convention of the Louisiana Association of Soil Conservation Districts, Baton Rouge, January 27, 1951.

I REGRET very much that I am unable to speak to you in person. I would like to be with you, but, unfortunately, the press of business in the United States Senate and the Senate Agriculture Committee, of which I am chairman, prevents my personal appearance.

I know of no group who can do more to help our fellow farmers and ranchers gear their operations for an all-out defense effort than you and the other supervisors of our Nation's more than 2,300 soil conservation districts. In many ways your position is unique for these times. You are not on anybody's payroll. In most cases you are meeting your farmer-charged responsibilities at personal financial sacrifice. There is a reward, however, for what you are doing. It is the satisfaction of knowing that you and the other farmers of your soil conservation districts have organized freely and voluntarily to protect and to use efficiently your land and water resources. The benefits of this work do not stop with the individual farmer and rancher doing it, but extend to all of our people. In doing this work through your soil conservation districts you are strengthening the democratic principles of self-government that made our Nation great.

Your work is an example of democracy and freedom in action. Our Nation today is mobilizing its resources to protect and defend that freedom



Hon. Allen J. Ellender, U. S. Senator from Louisiana.

against the threat of destruction by communist forces throughout the world. Our Nation today is mobilizing to make sure it can continue to guarantee you the privilege and right of representative self-government—the very form, spirit, and practice of soil conservation districts.

Although farming and self-government are just two items in the great jigsaw puzzle of our national affairs, they are two of the key pieces in this complete puzzle. And that is what I want to discuss with you today—the role of soil conservation districts in mobilization.

As we go into what might well be World War III, we can be thankful that our bins and cribs and warehouses are full. But in spite of this huge reservoir of food, American agriculture will have to expand and buckle down to work as never before. The American farmer will have to redouble his efforts, tilling his land and harvesting his crops with less help, fewer tools, and less fertilizer and insecticides. It is only by a further increase in our agricultural efficiency that we will be able to produce sufficient food and fiber for our needs.

Never has there been a greater need for agricultural efficiency. The efficiency of American farm-

ing must rise to meet the challenge of this period of full mobilization, and one of the principal bases for agricultural efficiency is conservation farming, the kind of conservation farming that our soil conservation districts are helping our landholders to practice.

I know of no better, quicker, and surer way for a farmer to obtain the basic tools for efficiency in farming than for him to get in touch with the supervisors of his local soil conservation district and use the help his district can give him.

I personally know what this district help means. I have availed myself of this help from my local soil conservation district. The district supervisors, along with Soil Conservation Service technicians, helped me plan the best use I could make of each acre of my land. They came out to my farm and made an inventory of my land to determine the best use I could make of each acre—an inventory based on careful measurements of the slope, degree of erosion, kind of soil, land use, and other important physical features.

With this information and with the help of the soil conservation technicians, I was then able to decide how I was going to use each acre to the best advantage, and how to provide the soil and water conserving measures that were needed for sustained, efficient production. I was also advised of the most efficient method to drain the water-soaked, unproductive acres of my land, all of which became part of my long-range farm plan.

Needless to say, this was to me a down-to-earth example of the technical conservation assistance our Nation has to offer its farmers. And this help was available to me as it is to any other landholder through a program organized and managed by fellow and neighboring farmers.

I have always believed that we as a Nation cannot devote too much support to promoting basic conservation practices on our farms and ranches. This is one of the most vital tools we need for efficient production—production for either war or peace. We justifiably have placed great emphasis on the many phases of farm credit, education, rural electrification, price supports, and other farm programs which have helped to open a new era of better life for our farmers and ranchers. But as a Nation we have not directed sufficient effort toward conservation on our farms and ranches. In our soil conservation districts, which now cover

more than 80 percent of our farms, we have the framework to get this conservation job done.

On one hand, it is encouraging to know that about one-fifth of this basic conservation job has been done, but on the other hand we cannot help but view with considerable concern the remaining job to be done as we mobilize our Nation for any eventuality. We must ask ourselves what must we do to provide all farmers and ranchers with the needed basic conservation information so they too can make the best use of their land and know the soil- and water-conserving practices it needs.

Conservation farming takes on even greater importance in wartime than in peace. It definitely is needed. No longer should soil and water conservation be looked upon as a luxury or as only a civic duty. It is an economic and a national defense necessity—and it will be more so as we get deeper into mobilization and as efficiency in agricultural production becomes of even greater importance.

We know that the kind of conservation farming sponsored through our soil conservation districts does increase per-acre production considerably. In addition, there are extensive savings in fertilizer, seeds, machinery, fuel, and manpower. These savings are important, and especially so during a war period when manpower and materials become scarce. Scientifically planned and applied conservation farming reduces the loss of crop producing topsoil, and the loss of fertilizer and seed which are carried away in uncontrolled runoff. We also know that there is less breakage and wear on farm machinery and equipment on those farms operated under sound conservation practices. There is also lower fuel consumption to operate that machinery. We know, too, that this thorough-type conservation farming in the upper watersheds of our great rivers helps to reduce destructive runoff, flooding, and silting of reservoirs which supply water and power—likewise wartime essentials.

Yet, even with all of these benefits known, there will be some who will look upon conservation farming as a peacetime activity—having no place in a war effort. Unknowingly, those who have such thoughts are supporting the downfall of our agriculture and of our Nation.

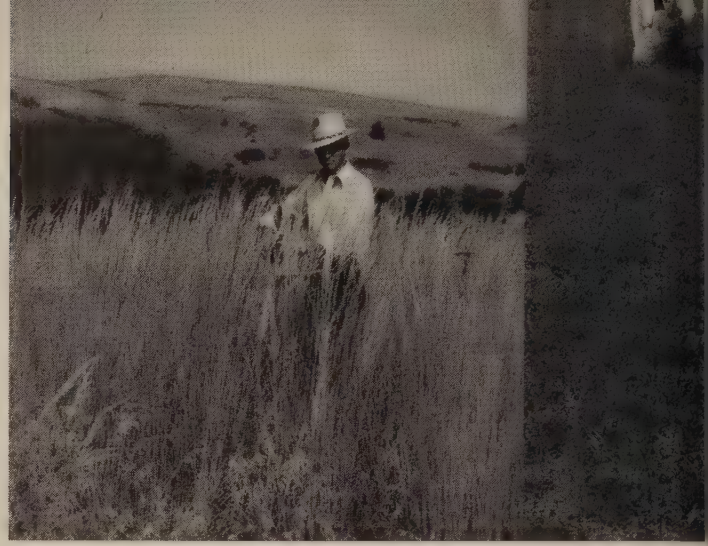
We have the important job of letting those people know the truth. They must learn that our Nation is no stronger than our ability to produce food and fiber at a minimum use of land, manpower, and

(Continued on page 212)

NEW Plants

for the

New Agriculture



Search for plants: Left, Vigorous strain bluegrass from Whitman County, Wash. indigo, high-value legume accidentally highway in Marion County, I

By FRANKLIN J. CRIDER

Prefatory Note.—The observational method of plant study as applied to the development of soil-conserving plants and techniques represents the first organized, systematic effort in this country to bring together, to study, and to evaluate plants for the specific purpose of soil and water conservation. The method was born of necessity. Dr. Franklin J. Crider took the lead in its formulation.

When soil and water conservation as a national program was inaugurated, the importance of plants as basic conservation tools—thick-growing plants, in particular—came to the forefront. There existed, however, the problem of establishing vegetative cover on millions of acres of seriously eroding farm and range lands.

During this early period Dr. Crider, as regional leader of nursery activities, had the important task

of providing suitable planting materials for conservation use in the Southwest. Undoubtedly, the adverse environmental conditions of this section as affecting plant adaptation, and ease of establishment, stimulated his efforts in the direction of the nursery observational method of plant evaluation. On being transferred to the Washington office in 1936 as head of the nursery division, Dr. Crider was ready with a plan which won instant approval and enthusiastic support as an integral part of Service activities.

—HUGH BENNETT.

IT IS the function of Soil Conservation Service nurseries to provide the highest quality planting materials for soil and water conservation. New and improved varieties of plants are brought into conservation use through a series of evaluation tests known as nursery observational studies.

Note.—The author is in charge of national observational nursery project, Soil Conservation Service, Beltsville, Md.



Native big
st. Blanket
and beside

Initial observational studies at Chapel Hill, N. C., nursery. Rows of individual accessions illustrate first testing stage of plants for soil and water conservation.

Strains of well-known species are grown in groups for comparison. Here six different strains of Canada wildrye are studied at the Pullman, Wash., nursery.

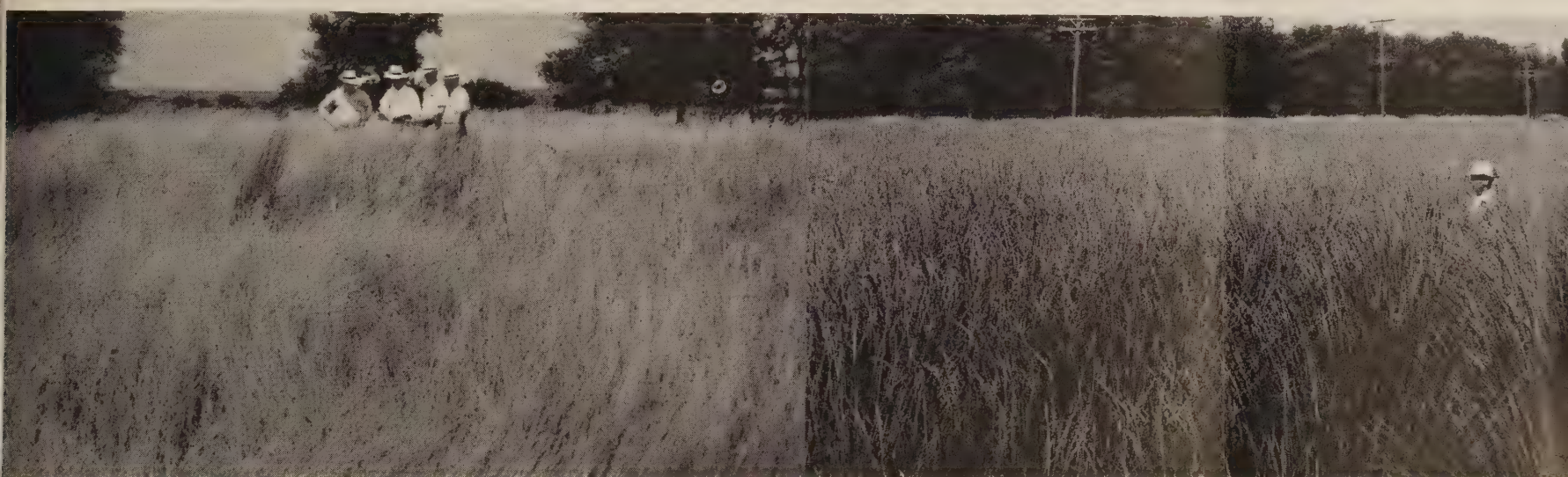
Grasses and legumes are advanced to more realistic field-plot testing. Here are Cucamonga brome and Wimmera ryegrass at San Fernando, Calif.



The nurseries also test plants for conservation use. Here six grasses are shown under comparative test as waterway covering at the national observation nursery, Beltsville, Md.



Promising accessions are grown in sufficient quantity to determine production methods and provide materials for subsequent field trials. Left, Fyngras; right, Boer lovegrass—Tucson, Ariz., nursery.



Final testing: field-scale trial of King Ranch bluestem on L. A. Nordon Ranch, Kendall County, Tex., 2 years after rough range was cleared of scrubby tree growth and saddle-horn seeded.

Foundation seed-production field of selected strain of blue wildrye—the ultimate goal of the observational studies. An authentic source of best conservation plants for quantity seed-production by farmers.

Designed to meet the specific requirements of the Soil Conservation Service, nursery observational studies entail constant search for species and variants of potential outstanding conservation values and testing them by comparative observation. As an intimate part of field operations, they ferret out and bring to light plant materials which possess the qualities of usefulness desired. Characteristically, the tests begin on the nursery and end out in the field where the farmer himself participates in the evaluation.

Nursery observational studies are conducted by the nursery division of the Soil Conservation Service through 25 regional nursery centers facilitated by the national observational nursery project at the Agricultural Research Center, Beltsville, Md. The work is closely coordinated with that of the other technical divisions of the Service and handled in collaboration with other Federal and State agencies engaged in related work. The key to its success lies in the fact that the technical facilities and cooperative relationships of the Soil Conservation Service are such as to facilitate the rapid transition of a promising accession or technique from initial trial to farmer-use.

The observational process begins before an accession is planted. Effort is made to bring under observation plants of potential soil and moisture conservation values, combined with other important economic uses, such as forage, farm woodland, and wildlife development.

Native vegetation has offered a ready, virtually untapped source of outstanding conservation plant materials. Nursery technicians, therefore, constantly keep on the lookout for wild species and variants which, because of some outstanding quality such as better ground coverage, greater soil-building capacity, or heavier seed production, are worthy of being brought into the nursery for observation. Another fruitful source of high-quality plant materials is cooperating Federal and State research stations from which strain selections resulting from plant breeding are obtained. Introduced species acquired by exchange also constantly are being incorporated into our trials.

As the first observational step, newly assembled plant materials are grown on the nursery in such manner that the characteristics and performance of the plant as an individual can best be determined. In most cases, especially with grasses and legumes, cultivated rows have proved most satisfactory. Also it has been found that evaluation is

facilitated by grouping the various species and strains according to similarity of composition, season of growth, or probable conservation use, with previously accepted standard varieties for comparison. After from one to several growing seasons the accessions are preliminarily evaluated.

Promising selections now are initially increased and subjected to such other on-the-nursery tests as may serve to further substantiate their superiority and applicability to specific conservation jobs. The terrain of a nursery often is representative of a fairly large section and as such composes several land-capability classes. Some of the lands are good and others poor, some level and others rolling and erosive, some irrigated and others that cannot be watered. These varied conditions provide ready means not only for observing climatic and soil influence and vegetative differentiation but make it possible to secure essential information on such problems as site adaptation, stand establishment, and soil building. It is not uncommon, therefore, to see waterways lined with several different grasses to test their erosion resistance, hillsides planted to various ground covers to compare their soil-holding and desilting capacities, plot plantings of grasses and legumes to determine their soil-building qualities and how they get along together, shelter strips of wind-resistant tree types, and wildlife borders of various shrub combinations.

The next stage of the observational procedure is a system of field trials which supplements the on-the-nursery tests. Located in representative farm or conservation problem areas, these trials are designed especially to further determine environmental limitations and erosion-control efficiency along with conservation crop values. The tests are simple and practical and vary in kind and design according to conservation objective, land-capability class, and the prevailing cropping system. Based upon the results of preliminary evaluations, they include only outstanding selections which appear likely to succeed in the particular farming area.

Further, a species or strain which continues to show distinctive superiority is placed under individual farm field-scale trial. This is accomplished by utilizing representative farms within the respective conservation problem areas. Here the selection is grown by the same methods and in close proximity to similar commonly used varieties.

All individual farm trials are designed to fit into the regular farm plans and work programs of the respective soil conservation districts. Planned by

the nursery and other directly interested technicians, they are participated in as well by the district conservationist and work unit conservationist.

Complete evaluation of a new species or variety sometimes is not possible without critical research measurement. This is provided for through cooperative understandings with the State agricultural experiment stations and the appropriate Federal research divisions who usually undertake the solution of a pertinent problem concurrently with our more-advanced stages of observational testing. Thus a newly recommended species or variety represents the combined judgment of all interested State and Federal agencies along with that of the ultimate user, the farmer himself.

Coordinated with plant evaluation as such is the development of improved techniques as relate to the incorporation of a new or re-evaluated conservation plant into farm or ranch operations. Designed to facilitate the application of selected species and strains to soil and moisture conservation practices, this phase of the work covers reproduction and cultural techniques and methods. More often the working out of successful procedures for propagating, growing, and handling a particular plant is as essential as determining its vegetative and adaptive qualities.

Thousands of potentially useful soil-conserving accessions have been processed in this manner. Outstanding in this particular are the good native grasses collected and brought into general farm use—species and strains not heretofore domesticated.

When soil conservationists in this country in the early thirties tackled the big, complex job of restoring vegetative cover to eroding farm and range lands, they were not long in learning the futility of seeding these drastically changed soils to the then-available commercial grass varieties. Thinking next of kinds nature originally provided—kinds which have survived the extremes of drought, flood, and fire—they turned to Service nurseries for seed supplies of our native grasses. With only one native species, slender wheatgrass (*Agropyron trachycaulum*), having so far found the way into the seed trade, and with little precedent as to how to go about taming these wild forms, this was no simple task. The seeds of some of our finest native grasses, such as the bluestems, are so fluffy, others like the wildryes and needlegrasses so bearded and sharp-pointed, and still others like buffalograss borne so near the ground, they defied harvesting

and planting by ordinary methods. To meet this emergency every nursery unit in our major native-grass areas concentrated upon working out the problem.

Enlisting the interest of other public and private agencies, the combined effort resulted finally in the development or adaptation of machines capable of handling satisfactorily even the most difficult seeds. A remarkable advance was finding that by adjustment and some major change the later makes of combines were generally suitable for harvesting purposes, handling with equal efficiency everything from the lowly buffalo-bur to the 6-foot bluestem plume. Another notable contribution was perfecting the use of the hammer mill for processing seeds. Removal in this manner of the feathery appendages and long awns, followed by recleaning, not only made sowing possible with regular farm equipment, but for the first time rendered such unruly seeds in condition to be handled by the trade.

Mastering the difficulties of harvesting and planting, however, was not the final answer to the domestication of our wild grasses. It took no expert to detect that seed from a particular site produced better grass than that from some other set of conditions. Nursery technicians, therefore, made use of the opportunity afforded by large-scale seed collection to note distinctive plant differentiations. Hundreds of these variants were collected. Placed under close observation in the nurseries, the naturally fixed, soil-conserving characteristics such as greater vegetative growth, large root systems, and better seed production, as expressed in individual or group plantings, became even more pronounced.

Continuing the evaluation process as previously described, superior geographic strain types of a number of our more important native grasses were isolated, named, and brought into conservation use. They are typified by such outstanding varieties as Sherman big bluegrass (*Poa ampla*), Bromar mountain brome (*Bromus marginatus*), Whitmar beardless wheatgrass (*Agropyron inerme*), Clatsop red fescue (*Festuca rubra*), Primar slender wheatgrass (*Agropyron trachycaulum*), Cucamonga brome (*Bromus carinatus*), Elreno and Vaughn side-oats gramas (*Bouteloua curtipendula*), Blackwell switchgrass (*Panicum virgatum*), and Mandan wild-rye (*Elymus canadensis*).

Examination of native stands revealed further that erosion combined with severe grazing had

taken its toll to the extent that some of our more palatable grasses were no longer available in collectible quantities. Notable examples were sand lovegrass (*Eragrostis trichodes*) in the central Great Plains, spike muhly (*Muhlenbergia wrightii*) in the Southwest, and purple needlegrass (*Stipa pulchra*) in California. From persistent remnant stands most of these old favorites likewise have been brought into the nurseries and increased to the point of availability.

Attributable directly to these studies, for the first time in the history of American agriculture the farmer now is able to turn to seed catalogs and, in addition to the varieties referred to above, find listed such valuable native grasses as big bluestem, little bluestem, sand bluestem, blue grama, slender grama, green stipagrass, buffalograss, western wheatgrass, beardless wheatgrass, bluebunch wheatgrass, yellow Indiangrass, Indian ricegrass, alkali sacaton, Texas wintergrass, and sand dropseed.

The remarkable success in domesticating native grasses prompted more recent effort to find untamed legumes for conservation use in our low-rainfall areas, a long recognized need. Nursery technicians have searched the mountains, foothills, and plains for suitable wild forms. Among those assembled in the nurseries are kinds sufficiently promising for the field-trial stage. American vetch (*Vicia americana*) and purple milkvetch (*Astragalus agrestis*), two deep-rooted, stoloniferous species which occur naturally in grasslands, illustrate the type of materials under observation.

The number and relative value of high-quality grasses and legumes of foreign origin brought into conservation use compare favorably with the native grasses domesticated. Some were obtained by seed exchange with technicians of foreign countries, others garnered as distinctive specimens from old fields and out-of-the-way places, and still others represent more common species whose conservation values had not been fully recognized and developed.

In some sections erosion induced by overgrazing or up-and-down-hill farming has so changed the soil and associated environment that even the native climax vegetation cannot, under prevailing conditions, be replaced. Such was the case on denuded range lands of the Southwest where repeated efforts to restore the original perennial grass cover met with failure. Through observational tests ini-

tiated on the nursery and completed on the problem area two good grasses from the dry veld of South Africa, Lehmann lovegrass (*Eragrostis lehmanniana*) and Boer lovegrass (*E. chloromelas*), finally were found that had the initial vigor and staying power to take over.

Finding a good grass for use in reclaiming the rocky, untillable Cedar Brake area of Texas posed a problem that was similarly solved. Here, following chopping down of the usurping juniper in a country so rough that the seed had to be scattered from horseback, King Ranch bluestem, a strain of *Andropogon ischaemum* from Asia, has taken hold and is continuing to spread by self-seeding. Deep-rooted and aggressive, it subdues weedy species and produces heavy ground cover and forage under the most adverse conditions.

Observational trials likewise have revealed that tall wheatgrass (*Agropyron elongatum*), also an immigrant from Asia, is especially suited to wet, alkaline soils. As such, it is filling an important place in providing productive cover for salty lands in the Midwest. Further, these studies have brought to light three other Asiatic grasses, Manchar smooth brome (*Bromus inermis*), and strains of intermediate wheatgrass (*Agropyron intermedium*) and sheep fescue (*Festuca ovina*), well suited to the critical erosion problem area of the Palouse in the Northwest. Falling in the same category is Hardinggrass (*Phalaris tuberosus* var. *stenoptera*) from the Mediterranean region which has been found especially adapted to conservation use in the winter rainfall belt of California.

Turning less specifically to the East, where few good native grasses and legumes exist, we must look almost entirely to foreign sources for close-growing, soil-conserving species. Through observational tests in this section, several heretofore overlooked exotic grasses and legumes have been brought into conservation use, including Pensacola and Wilmington Bahiagrasses (*Paspalum notatum*) and blanket indigo (*Indigofera pilosa*). In addition, re-evaluation of the more common species for soil conservation has greatly extended the use of valuable varieties such as Kentucky 31 fescue, coastal Bermuda-grass, rescuegrass, Ladino clover, Caley-pea, blue lupine, hairy indigo, and self-seeding crimson clover together with sericea, annual, and bicolor lespedezas, and kudzu found especially suitable for protecting and rebuilding worn-out soils in the South.

Other introduced grasses of major importance brought into conservation use include weeping lovegrass, Wilman lovegrass, Fischer and Elsberry smooth bromes, Russian wildrye, pubescent wheatgrass, and blue panicum, none of which were available to farmers prior to initiation of these studies.

Likewise brought into conservation use for the first time are many specifically adapted woody species, exemplified by: stoloniferous, dense-growing coyote willow (*Salix exigua*) for stabilizing stream and pond banks; drought-enduring Africa wild olive (*Olea verrucosa*) and bladdersenna (*Colutea arborescens*) for dry-situation windbreaks; vigorous, straight-trunked black locust (*Robinia pseudo-acacia*) for farm fence posts; big-berried American holly (*Ilex opaca*), tart-fruited mulberry (*Morus alba*), and disease-resistant Japanese raspberry (*Rubus parvifolius*) as supplemental cash crops on steep hillsides; dual purpose multiflora rose (*Rosa multiflora*) for living fence and wildlife cover; and cold-hardy, early-maturing bicolor lespedeza

(*Lespedeza bicolor* var. *Natob*) that extends much farther north the range of this important game-food species.

Operating over a period of 15 years, nursery observational studies are making profound contributions to our national soil and water conservation program and agriculture generally. In contrast to earlier effort before the results of these studies became effective, Soil Conservation Service nurseries now are able to grow the highest quality, specifically applicable planting materials. Supplementing on-the-nursery production, seed stock is made available to soil conservation districts for further increase and use. In many cases the seed from the nurseries is foundation seed stock from which the grower produces certified seed. Constantly multiplied and applied to the land, these superior varieties mean more soil held in place and improved, more and better pastures, higher crop yields, and greater farm income.

OIL COMPANIES FIND ANSWERS TO SALT-WATER PROBLEM

By WALTER F. EDMUNDSON

A RECENT investigation of skin hazards was made among workers in the salt-water disposal systems in the east-Texas oil fields. Although the investigation revealed no definite skin hazard in handling the salt water, the operation of these systems was extremely interesting from the viewpoint of the public-health worker. These systems were operated by a company organized as a public utility by some of the oil companies working this field.

Before these systems were in operation, salt water pumped from the field in mixture with oil was separated from the oil and disposed of by dumping the salt water into the nearby streams or on the land. As a result, there was considerable damage done by this water. The vegetation and aquatic life were killed and the streams were

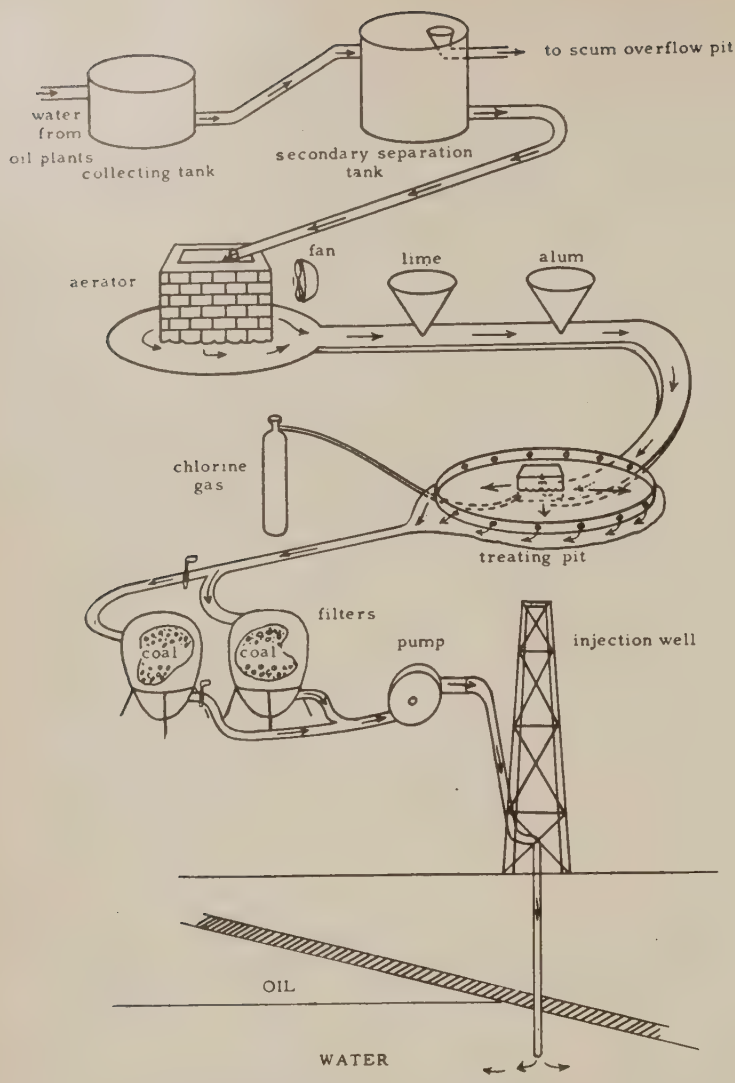
rendered unfit for domestic or industrial use. The water also formed reservoirs of brackish water which encouraged mosquito breeding.

For the last 8 years the practice of injecting the salt water back into the ground below the oil level, after appropriate treatment, has operated. This operation has, of course, solved the problem of



Salt-water damage as seen in east-Texas oil fields near Kilgore.

Note.—The author is surgeon, dermatologist, division of industrial hygiene, Public Health Service, Federal Security Agency, Washington, D. C.



Composite salt-water disposal system.

land and stream contamination, as well as served a useful purpose to the oil companies.

Before salt-water injection systems operated, there was a continual loss of pressure in the oil field and increased pumping pressures were required, since, with the extraction of oil, water, and gas from the ground, less pressure was exerted. With injection of the water below the oil pool, the pressure in the field has remained almost constant, with little or no reduction in pressure in the last 8 years.

There are about 23,000 operating oil wells in this field, with 40 salt-water injection systems servicing the great majority of the wells. Each system injects from 3,500 to 40,000 barrels of salt water daily. The purpose of treating the water is to separate further the oil from the water, to cool the water, to flocculate and filter out iron salts and extraneous nitrogenous matter, and to inhibit the scum-forming salt-water bacteria which quickly

contaminate it. This procedure allows the injection of relatively scum-free water into the sand which does not quickly plug the porous sand, thus avoiding the necessity of costly cleaning operations of the sand or the drilling of another injection well.

PRESS AND RADIO

(Continued from page 198)

becoming more and more apparent as the contest continues.

During the first contest in 1948, most businessmen of the State showed little interest in whether or not the district in their locality took part in the event. In 1950, however, businessmen were as keenly anxious that the local district win as were the supervisors.

This year, businessmen in the territory of the five victorious districts were active in helping to arrange and manage recognition banquets at which the awards were made. It was my pleasure to attend the award dinner for the Sedgwick County Soil Conservation District, which placed first in the contest. Businessmen from the entire county took great interest in the event. The award dinner for the East Routt Soil Conservation District was termed by the editor of the *Steamboat Pilot* "the greatest recognition ever brought to Routt County."

The contest also is bringing to the attention of everyone the fact that there is a tremendous need for soil conservation in Colorado, and that something is being done about it on a sound and economical basis.

Furthermore, the year-around contest publicity is proving highly beneficial to the conservation program. Conservation practices, and what they mean in maintaining production, are stressed by press and radio. Outstanding work of individual farmers and ranchers which otherwise might go unobserved is spotlighted.

The contest invokes the interest and cooperation of organized groups such as service clubs, lodges, chambers of commerce, technical and professional organizations, and numerous others.

In my opinion, the Denver Post-KLZ soil conservation contest is unique and outstanding and well worth emulating in other conservation-minded communities.

BOMB SHELTERS

(Continued from page 197)

These results showed that for complete protection of the soil, about 5,000 pounds of cover per acre is required. This amount provides on the average of 98-percent effectiveness in controlling splash. This total cover includes both forage and litter—everything above the soil surface to stand in the way of a falling raindrop. Amounts in excess of this were found on nearly every site, and examples of 99-percent and 100-percent effectiveness were not uncommon.

Soil splash increases rapidly as the amount of cover on the range decreases below 3,000 pounds per acre. This amount is about 95-percent effective. It would permit enough of the drops of the test to reach the ground to dislodge the equivalent of about 3 tons per acre of the standard sand. *On most range soils, splash would be less than 2 tons per acre with 3,000 pounds of cover present.*

In smaller amounts cover rapidly loses its sheltering effect. Average effectiveness of 2,000 pounds per acre is about 90 percent. Below this point, its value declines in an almost straight-line relationship to the zero point.

Of course, soil splash alone does not mean that the soil is forever lost from the spot. Removal of the detached particles depends upon another step in the erosion process, transportation, which is dependent mainly on surface flow.

Soil splash is damaging to the land in other ways besides bodily removal of the soil splashed into the runoff waters. *Even if the dislodged particles are not carried away in the runoff, the churning of the soil in the water on the surface increases the amount of soluble and colloidal materials contained in the runoff.* Once in solution, no matter how slowly the excess water moves off, much of these vital materials are carried away.

The beating of the drops compacts the soft dispersed soil particles on the surface and creates smaller pores so that the land is sealed against the entry of water. This effect of raindrop splash contributes additional water to the runoff available to transport the loose material and complete the erosion process.

Comparison of water losses from plots with different amounts and kinds of cover reveals the relationship of this process to soil splash and to the related cover and soil conditions. On every site tested,

excepting two very shallow soil profiles, one or more plots with the best cover absorbed virtually all of the 2 inches of water applied in 20 minutes. Yet, on all sites, water losses usually exceeded 60 percent of the applied amounts when effectiveness of the cover was less than 40 percent.

How soil splash and water losses go hand in hand with cover conditions is illustrated by results from one site summarized in the table below. Results from 18 plots on a deep, fine-textured, slowly permeable soil of the Edwards Plateau near San Angelo, Tex., are grouped and averaged by the range-condition class of the cover and compared to the plot with maximum cover.

Soil Splash and Water Loss from Edwards Plateau Deep Upland, Averaged by Range-Condition Classes

Range-condition class ¹	Number of plots	Total cover per acre	Effectiveness of cover	Water applied 20 min.	Water lost from plot
	Number	Pounds	Percent	Inches	Percent
Best plot	1	8,378	99	2.18	0
Good	6	4,569	87	1.98	30
Fair	3	2,131	83	1.91	48
Poor	7	697	55	2.01	65
Bare plots ² ..	2	-----	-----	2.13	46

¹No examples of excellent-condition range were tested on this site.

²One in fair-condition range and one in poor-condition.

Many variable factors, some of them still poorly understood, may influence the exact amount of soil splash which could safely be tolerated on different soils and slopes. If these were known, the cover could be tailored to the exact requirements in each case to prevent soil and water losses.

Until these are learned, however, the cover evaluations in Texas point to a safe general standard for ranges of that area. By maintaining 3,000 pounds of forage and litter per acre, soil splash will be held to a negligible level. The erosion process will be stopped before it starts. The land will be truly provided with shelter from the blasting action of bomb-like raindrops.

IMPROVED GAME.—A “Soil Golf Tournament” was recently sponsored by the Loup City, Nebr., Chamber of Commerce and the Nebraska Conservation Foundation. Among participants were FFA and 4-H Club members. An 18-hole, 2-mile course was played. Holes were dug to reveal soil profiles, permit feeling of samples. Each player had a score card. The best jobs of classification and suggesting cropping systems and conservation practices were rewarded by ribbons and team plaques.

DISTRICTS AND NATIONAL DEFENSE

(Continued from page 203)

other materials. The less we use of these to produce the food and fiber our Nation needs, the more manpower and other resources we have for the manufacture of instruments of war, upon which may someday depend our very lives.

Too often we are prone to estimate our Nation's strength merely by the number of men we have in our armed forces, the number of planes, battleships, and guns we have on the firing line. Our actual strength, however, is based as well on the productive capacity of each acre of land and the ability of our farmers to use that land safely and efficiently. It therefore becomes a problem of national import that, as we prepare ourselves for the defense of our Nation, we not overlook the necessity to guide the American farmer and rancher so that he can practice effective conservation farming which is the base of efficiency in agriculture.

None of us knows how long this period of full mobilization may be—whether for five, ten, or for how many years. But we do know that we must move ahead with greater speed toward the completion of this basic conservation job. We cannot permit our land resources to be dissipated unnecessarily during this period of all-out production. When peace is restored, our land must still be capable of producing sufficiently for our people. If we fail to protect the productivity of our land, our victory will be but half complete.

Using each acre of land for the purpose it is best suited is just as important, if not more so, than having the proper piece of equipment on the farm, or having the best seed for the crops we want to produce. Likewise, the employment of those soil- and water-conserving practices each acre needs is of vital importance to our agricultural economy.

Conservation farming, therefore, must not take a back seat as we gear our operations for all-out mobilization. If anything, I would feel a lot safer if we accelerated our efforts toward conservation farming. And I say that not necessarily as a matter of personal choice, but as common-sense logic.

You as district supervisors, therefore, face a great challenge as you gear your own district operations to meet your responsibilities in mobilization. One of the first jobs to be done is for you and others in your soil conservation districts to

strengthen your work programs for the defense effort.

You will need to place greater emphasis on those activities which will get the basic conservation job done as soon as possible—and cut out those activities which become of secondary importance during this emergency period.

If I may suggest, I believe your first priority of work should apply to insuring that all farmers and ranchers know the best use they can make of their land and the major conservation practices each acre needs. But in speeding this work let us not substitute guess-work for accuracy. This soil conservation district assistance must be as accurate as it is possible for us to achieve. I also believe that you should set a time limit in which to get the basic job of conservation farming established on every farm or ranch in your district. Call together all of the farmers and ranchers of your district and mobilize everyone to get this job finished in as short a time as possible. Once it is done, we can then concentrate on the follow-up program which will be necessary to achieve complete soil and water conservation.

None of us can forget that we all have a great deal in common. You are farmer-elected supervisors charged with the responsibility of conducting the affairs of your districts. All of us know what the districts are doing. I am also an elected supervisor, you might say, except my job as Chairman of the Senate Committee on Agriculture and Forestry is to formulate our whole Nation's agricultural plans and policies.

Our common objective demands that we work together, that we stand side by side in our fight for effective conservation, a healthy agriculture, and a free and democratic Nation. Only in that way will we be victorious and preserve our cherished way of life.

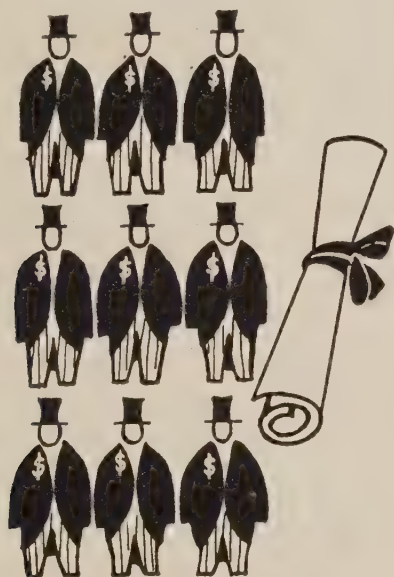
CROWDS ARE MADE UP OF CLUSTERS

(Continued from page 200)

those in attendance. Here, in the neighbor group, ideas are stripped of fancy trappings, discussed, analyzed, revised. Here is where conservation farmers or ranchers are born, where soil conservation becomes a part of the group's way of thinking and believing, and where it influences everyday actions.

During the past 5 years the Soil Conservation Service has worked to develop ways and means of learning to recognize and work with neighbor groups. The process was speeded up when a method was found by which the membership of such groups could be determined. Virtually all Service field employees have been trained in this process. Now they are gaining experience on how best to work with people in these natural groups, by carrying on many soil conservation activities in on-the-farm get-togethers with them. In 1950 technicians worked with some 24,000 neighbor groups with a membership of about 180,000 farmers or ranchers over the country as a whole. *Neighbor groups are in action!*

NOTES FROM THE DISTRICTS



RECOGNITION REVERSED.—The Georgia Association of Soil Conservation District Supervisors recently said “thanks” to bankers and others who signally helped its work during the past few years.

The appreciation was expressed in framed “certificates of award” to representatives of nine banks; to Alexander Nunn, managing editor of *Progressive Farmer*; Elmo Hester, former farm editor of the *Atlanta Journal* and now on active duty with the Army; the Georgia Press Association; and the Georgia Bankers Association.

Banks receiving the certificates were the Bank of Soperton, the Citizens National Bank of Quitman, the National Bank of Fitzgerald, the Peoples Bank of Carrollton, the East Atlanta Bank, the First National Bank and Trust Company of Macon, the Commercial National Bank of Cedartown, the First National Bank of Waycross, and Etowah Bank of Canton.



W. F. Hall (left) hands award to M. A. Thompson, president of the East Atlanta Bank.

Presented by W. F. Hall, retiring president of the association, the certificates commended the banks for their efforts in behalf of soil conservation districts and “for extending credit to facilitate the application of soil and water conservation plans, based on proper land use and treatment.” This work by the banks, it was stated in the certificates, “contributes to the well-being of our people and strengthens our State and Nation both today and for years to come.”

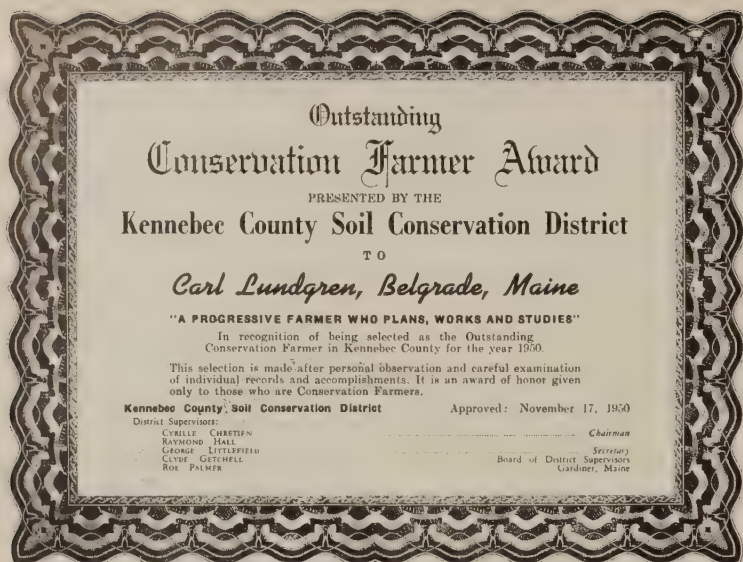
“As far as we know, this is the first time district supervisors have presented certificates of award to bankers,” said Hall. “Our Georgia banks, and those in several other States, have been presenting certificates of merit to outstanding district cooperators for a good many years.”

The banks receiving the certificates were nominated by the Georgia Bankers Association.



SOCIETY NOTE.—“The bride had a carpet of green to walk on. When Clair Council returned from her wedding yesterday to William Zorn she trailed her veil across the only green grass in Ware County.

“You would just know that her father, Ware soil conservationist, J. C. Council would have a show window garden. The lawn of their beautiful new home on Cherokee Drive is an oasis of green grass amidst deserts of dead grass.”—from the *Waycross (Ga.) Journal-Herald*.



TOP MAN TABBED.—Each of three districts in Maine recognizes its top conservation farmer of the year by a certificate designated an “Outstanding Farmer Award.”

The award, presented at the annual meeting, started with the Androscoggin Valley in 1949. The idea was picked up and adopted for 1950 by the Kennebec County district and the Waldo County district.

NEW SEEDING DEVICE.—Two years ago many central-Texas farmers were having trouble with heaving and freezing of small grains and clover. The clover needed a nurse crop planted at the same time and both needed fertilizer. The clover needed to be planted at 1/2-inch depth while the oats nurse crop and the phosphate needed to be one or more inches deep.

Thanks to Ben R. Day, of the Goldthwaite headquarters of the Soil Conservation Service, the

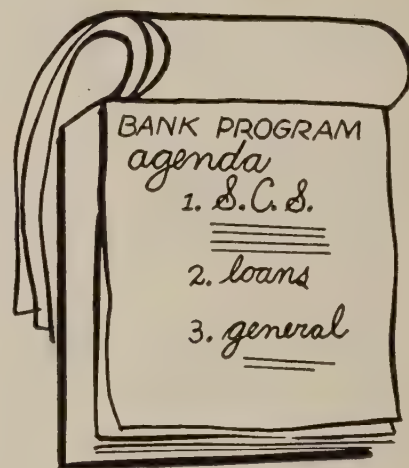


Ben R. Day shows how hose conducts seed part way back on chain. The furrow is partly filled before the clover seed drops.

farmers in the Brown-Mills Soil Conservation District now have drills which will sow small grain and clover correctly and put out fertilizer in bands at the same time.

Day bought enough garden hose to extend each clover spout 32 inches. The spout fitted snugly into the rubber hose and the hose was passed under the drill boxes. In order to hold the hose securely behind each disk opener, a 7/8-inch hole was bored in a block of wood 1 inch by 2 inches by 10 inches, and the hose was forced through this hole.

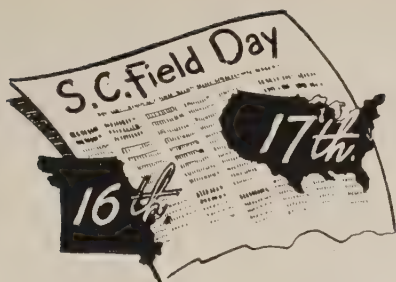
The block of wood was then attached underneath the footboard on the drill directly behind each opener. The hose was then adjusted in its holder so that the clover seed would fall in the same furrow with the small grain and fertilizer, but after the drag chain had knocked some soil back in the furrow. The drag chain then would cover the clover seed to the proper depth.



COUNTRY BANK PLANS.—“Soil conservation has a major position in the programs of all state bankers associations,” says a brochure issued by the Agricultural Commission of the American Bankers Association. The commission will emphasize the following four projects during the current year—

1. Encourage the development of a sound conservation plan for every farm and ranch in the Nation. A copy of the farm plan should be made available to banks and become a part of the farmer's credit file.
2. Develop a credit program to support financially soil improvement practices.
3. Work up a plan of credit to assist farmers in certain areas to change from one-crop agricultural production to that of diversification.
4. Have every State appraise its idle acres—and develop a plan of productive use for them in pastures or timber.

The committee in charge of this field of work is as follows: Hubert P. Burdette, Mount Airy, Md., chairman; E. E. Bailey, Princeton, W. Va.; Darryl R. Francis, Memphis, Tenn.; J. R. Kenner, Hebron, Nebr.; Herbert H. Pye, DeRidder, La.; and Dr. Lippert S. Ellis, Fayetteville, Ark.



1951 HEADLINE EVENT TO MISSOURI.—

The National Soil Conservation Field Days and Plowing Matches will be held near Bethany, Mo., on August 16 and 17, 1951. The first day is designated for State contests, with the second reserved for National events. To handle the tremendous program a board of directors has been set up with representation from farm organizations; civic, church, and youth groups; implement dealers; bankers; and agricultural agencies.

The events will take place 10 miles south of Bethany, on U. S. Highway 69, on 1,000 acres belonging to George Montgomery, Emil Salmon, Glen Maize, Jewell Maize, Olin Youngs, Henry Everly, and Bob Crabtree.

Among the high lights listed as in prospect are the following—

Conservation demonstrations and test plots including most phases of modern agriculture.

Champion plowmen from throughout the Middle West will compete in level-land and contour plowing.

Livestock demonstrations and exhibits.

Farm building, fence and lot arrangements.

Farm machinery and mechanical labor-saving devices of all kinds.

Lime and fertilizer demonstrations.

Pasture and livestock feeding demonstrations.

New methods of handling hay, and grass and legume ensilage.

Forty acres commercial exhibits, displays, and food concessions.

Tractor rodeo.

Heavy earth-moving machinery will be in operation.

Six large parking areas—200 acres of bluegrass pasture.

Landing field for Flying Farmers.

Wagon tour to neighboring conservation farms.

Harrison County has been a pioneer in the adoption of conservation farming since the establishment of a soil erosion experiment station near Bethany in 1929. This was followed by the organization of a soil conservation watershed demonstration area in 1933. The first soil district in Missouri was voted by Harrison County landowners in 1944.

Missouri is proud to be host to the 1951 match. It plans to equal the high standards set in Iowa and Ohio. Attendance at the 1950 match in Ohio exceeded 60,000.



The use of a green-manure crop practically doubled corn yield for C. P. Bryant, Las Animas, Colo.

GREEN MANURE DOUBLED YIELD.—The use of a green-manure crop has practically doubled the corn yield on his farm east of here, according to C. P. Bryant, president of the Bent (Colo.) Soil Conservation District.

On May 4, 1950, Bryant planted hybrid corn on two fields of his 90-acre irrigated farm. Soils of both fields are clay loam. Throughout the growing season, the two fields were cultivated in the same way and irrigated at the same time. The only difference was that one field had a sweetclover crop turned under as green manure the previous fall.

At harvest last fall Bryant found that the field on which the clover had been turned under yielded 70 to 75 bushels per acre, while the untreated field produced only 35 to 40 bushels.

Bryant also reports that yields from his entire farm have been practically doubled since he purchased the land in 1941. He attributes much of his success to the use of soil and water conservation practices. He was the first cooperator of his district when it was organized in 1942.

BACK COVER.—Sherman Sigler, photographer for the *Sterling (Colo.) Advocate* is responsible for making this fine view of portions of several farms near Highway No. 6, west of Fleming, in the South Platte Soil Conservation District in northeastern Colorado. The pattern show alternate rows of small grain stubble and others processed by blank listing.





May 1951

Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

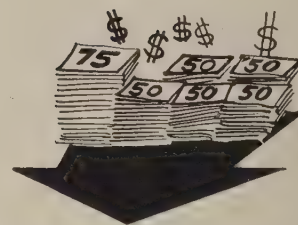
SOIL CONSERVATION.

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

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☆ THIS MONTH ☆

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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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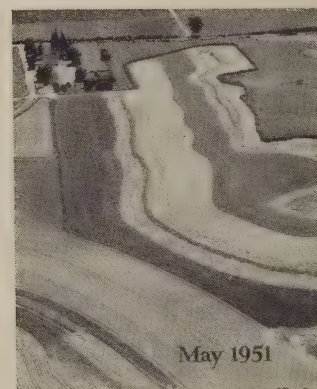
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TEACHING THE TEACHERS.—Scholarships—five of \$50 and one of \$75—made it possible for six Montana school teachers to attend the first conservation education workshop at the University of Montana, at Missoula.

Districts providing these scholarships were the Missoula County, Bitter Root, Mineral County, Three Rivers, Chouteau, and Hill County. Most distant from Missoula was the Hill County Soil Conservation District, whose representative had to travel nearly 350 miles to the workshop and therefore needed a larger sum for expenses.

Ross A. Williams, dean of the School of Forestry, was in charge of the workshop. He was formerly with the Soil Conservation Service. Members of the university staff and Federal and State agencies participated.



FRONT COVER.—This 134-acre Bittersweet Dairy Farm, near Chestertown, Kent County Soil Conservation District, Md., belongs to Stanley B. Sutton & Son. A complete conservation farm plan has been in effect more than 11 years. The farm includes 84 acres cropland, 30 acres permanent pasture, 12 acres woodland, 8 acres in homestead and roads. Strips are in corn, barley, and hay—some of them 1¼ mile long. The original barn (now remodeled and enlarged) is more than 100 years old; the house, more than 120 years old. Photographer: Gordon S. Smith.



Eight national winners, with Raymond C. Firestone. Front, left to right: J. Robert Gochnauer, 17, Calhan, Colo.; Grady Torrance, 16, Milledgeville, Ga.; Jere Wise, 16, Newton, Iowa; John M. Burrier, 20, Union Bridge, Md.; Raymond C. Firestone. Rear: Gene Robberson, 21 McAlister, N. Mex.; Bruce E. Ketch, 20, Bath, N. Y.; Roland W. Schwanke, 19, Watertown, S. Dak.; Robert Buck, 18, Tennessee winner (address, Guthrie, Ky.).

4-H CLUBS HELP SAVE NATION'S SOIL

By G. L. NOBLE

AN acre of good soil is worth more to sustain a life than all the skyscrapers in New York City! So reasoned 4-H'er Jere Wise of Jasper County, Iowa. Jere won national recognition for outstanding work in the 4-H soil and water conservation program.

Sixteen-year-old Wise is but one of several hundred thousand 4-H Club members who realize the importance of productive soil, and toward that end are practicing conservation. These rural boys and girls receive guidance and training from the Extension Service, the Soil Conservation Service, and local club leaders.

Note.—The author is director, National Committee on Boys and Girls Club Work, Inc., Chicago, Ill.

Because of the project's wide scope, time, and manpower involved, the 4-H program was revised last year to meet the needs of two different age groups: those 10 to 14 years, and those 15 to 21. The plan worked out very well, and awards were presented to both groups by the Firestone Tire and Rubber Co., sponsors of the program, in cooperation with the Extension Service, and the Soil Conservation Service.

It is difficult to put a price tag on the project. However, 4-H'ers who have studied and practiced conservation methods are convinced that the value to both the individual farmer and to the Nation as a whole is immense. Those boys and girls know, too, that the success of their endeavors depends upon getting parents to understand what is needed to preserve the soil. If it weren't for a 4-H son or daughter, many fathers would continue farming

practices which would eventually lower their income and work hardships on the entire family.

The 4-H boys selected last year for doing the most outstanding job in soil and water conservation have learned many useful agricultural practices. Above all, they have learned what a priceless possession the topsoil is, and are striving to hold it.

Bruce Ketch, who lives on a dairy farm in Steuben County, N. Y., reports that by using recommended practices over an 8-year period, he and his dad were able to improve crops and pastures for dairy cattle until butterfat production increased nearly 100 pounds per cow. One of Bruce's undertakings was to restore a 4-acre pasture which hadn't been plowed in 25 years. Layers of stones had become imbedded under the sod. After plowing, and then harrowing the ground seven times, Bruce netted 10 large loads of stones and a pasture ready for production.

Soil conservation also paid off on the Moore farm in Delaware County, Okla. Charles Moore, a 4-H'er since he was 8, soon realized that the land was gradually being washed away, and conservation became his leading project. He explained to his father what was happening. It wasn't long before they were working together on a program set up by the county agent and the nearby Soil Conservation Service office. They built ponds and outlets, added minerals to the soil, planted pastures, and adopted strip cropping and contour farming. The place now consists of 130 acres of cultivated land; 105 acres of permanent pasture, 4 acres in meadow, and 5 acres partly landscaped around the farmstead. Best of all, crop production per acre has doubled.

Back in 1880 a covered wagon—gray with dust and mud—came to a final halt on a barren stretch in El Paso County, Colo. There were no shrubs, trees, water, or shelter. To this new frontier had journeyed the Gochnauer family from their home in Illinois. Here, today, lives the grandson of that foresighted pioneer. He is Bob Gochnauer, a 4-H'er, who won a \$300 scholarship for achievement in the soil and water conservation program.

Bob and his father continued and improved on the practices begun by Grandfather Gochnauer, who was one of the few farmers in those early days to realize that crop rotation, windbreaks, and stubble were necessary to hold the land and keep it productive. Through Bob's 4-H training, and assistance from the Black Squirrel Soil District, 1,000 acres of the 1,600-acre farm were contoured grasslands. Ponds were added, strip cropping used, and some 2,000 trees planted. From all indications, the Gochnauer farm will remain in expert hands for still another generation, because Bob plans to continue his studies in agriculture at college.

Within 10 years the Torrance farm in Baldwin County, Ga., has been restored largely through son Grady's 4-H Club participation in the soil conservation project. He won national honors for good work.

The Torrance farm had been planted to cotton year after year, sapping most of the fertility from the soil. Sheet and gully erosion had seriously damaged the land. Now, following a carefully planned program, erosion has been controlled, crop yields have increased, and pastures have been restored.

Many similar stories of 4-H accomplishment in conservation could be told. They are reports of "learning by doing," which is the 4-H way. The number of boys and girls taking part in the national program is steadily increasing, as well as the number of counties producing winners.

More than 1,600 4-H delegates to the last National Club Congress saw the impressive color-print exhibit of rural America developed by the Soil Conservation Service. Titled "The Land We Live By," the presentation showed important aspects of conservation farming, as well as universal problems affecting the productive use of land and water resources. Varying from the tragedy of wind and water erosion to the strength and assurance of fertile, well-tended lands, the display made a great and lasting impression on the young people, on their club leaders, and on the many parents who were there.

An unusual part of the exhibit was the furniture made from woods ordinarily grubbed out and thrown away. Useful and beautiful, the articles emphasized realistically the economic value of com-

(Continued on page 226)



4-H Clubbers of Mt. Vernon, Ohio, learn that a farm pond is fine not only for livestock but also for fighting fires, swimming, and fishing.

GROUP ACTION IS A MIGHTY FORCE IN THE NORTHWEST

By HERB BODDY

SINGLE-HANDED or in groups, farmers of the Pacific Northwest are seeking the answers to their soil and water conservation problems. Scores of Washington, Oregon, and Idaho communities have irrigation, erosion, drainage, and high-water troubles that have gone unsolved for years. Those farmers who have tackled their worries through self-help, group-action movements say that by pitching in together they found they could work out all kinds of tough, complex land jobs.

Here are some of the talking-points they offer for group action:

1. Big and little community, and neighborhood-wide, land jobs generally can be worked out at less cost to individual farmers.
2. Needed conservation work can be done faster and, in most cases, more efficiently.
3. The over-all group-action job can be speeded up by doing technical and engineering work on a community-wide scale.
4. Whole communities benefit from farmer-action projects.

For a first-hand look at group action, let's see how things are shaping up in the Swan's Trail community in northwest Washington. Two years ago 26 farmers pitched in to drain their lands. Last spring more than 500 acres of wet, low-production land in the area was in top working order for the first time.

Tennis A. Roetiscender, a Swan's Trail farmer and a leader in the community's swing to conservation farming, looks at group action this way:

"We had a big land-drainage job to do. But, the cost was too high for any one farmer to bear. Yet at \$500 an acre our lands were too valuable to sit idle. When it dawned on us that it was a case of sinking or swimming together, we joined forces. The step to group action helped 26 of us drain from 1 to 72 acres of the wettest kind of land."

NOTE.—The author is information and editorial specialist, Soil Conservation Service, Portland, Oreg.



Twenty-six farmers cooperated in draining 558 acres in Swan's Trail community. Here is main control structure: 6-foot culvert with standpipe and 3,000 gpm pump. James Spada, SCS technician, checks water level on land side of dam.

The Snohomish County Soil Conservation District, from which hail such baseball greats as Earl Torgenson, Boston Braves infielder, and ex-major leaguer, Earl Averill, is one of the country's strongholds for the group-action kind of teamwork. So far some 35 successful group-facility movements have been carried out in the county.

Like other Snohomish County communities, Swan's Trail farmers were up against the problem of draining wet, fertile, Classes I and II lands. Other conservation work was needed, too, including seeding of good pasture mixtures and soil-fertility building. But the task of ridding fields of water came first.

There is frank pride in the talk of Swan's Trail landowners now. Many of them are enjoying full use of their old water-laden fields for the first time.

But, they wince when they recall how things stacked up a few years ago.

Here's how Roetciscender describes the farming picture in the 1940's:

"Half of the Swan's Trail area badly needed drainage. Yields of peas, corn, broccoli, spuds, and pasture and hay crops were way down. Farm incomes were dropping steadily. Some 500 acres had been allowed to go back to sedges. Farmers could farm productively only near their homes, on higher ground along the banks of the Snohomish River.

"Our Swan's Trail community is one of the oldest farming areas in the county. Years ago we had a taste of group action. We worked together to put in a main drainage ditch through our lands. But before long the ditch clogged up and that was the end of our drainage system. It was just too much work for one farmer to keep it open.

"The water table of most of our farm drainage ditches was too high to drain the lands properly. Our Puget clay and Snohomish silt loam soils were losing fertility fast. Much of our lands were already leached and sour. Lands were so waterlogged we couldn't till or seed half of our acreages. The best we could do was a little summer grazing off native pastures."

Roetciscender likes to skip over those lean years. But, he warms up readily when you ask him to tell about the farmers' second and most successful group-action undertaking.

Says he, "Twenty-three of us met in 1948 to see what could be done about things. We agreed to set up the same kind of group-action program as other Snohomish County communities were using.

"Our new Swan's Trail drainage district joined in a working agreement with the soil conservation district. Soon technicians of the Soil Conservation Service were out on our lands getting a line on our conservation needs. They made soil surveys, worked up engineering data for the drainage job, and outlined the capabilities of our lands.

"We were a bit taken aback when the technicians explained what had to be done. The 3,500-gallons-per-minute pumping plant, tide gates, and extensive ditching system sounded like big money to us. But, actually, the cost per farmer was relatively small when we divided the \$9,190 job among 26 of us."

By April 1949 a private contractor had cleaned out and dropped the water table of the main drainage channel. The new pumping unit and tide gates

were in place and a good start had been made in laying farm "feeder" ditches connecting with the main drainageway.

When the wet lands began to drain, Swan's Trail farmers lost no time putting in selected pasture-seed mixtures. The seed mixtures were worked out jointly by members of the Snohomish County staffs of the Production and Marketing Administration, the county agent, the Soil Conservation Service, and the soil conservation district.

The agencies recommended the following pasture mixture as being adapted for use in the newly drained Swan's Trail area:

	Pounds per acre
English rye	3
Akaroa orchardgrass	4
Alta fescue	6
Alsike clover*	3
White Dutch clover	3
Red clover	4
	—
Total	23

*Alsike clover is deleted when red clover is used in the mixture. Red clover is added when the pasture is to be used primarily for hay.

Farmers plowed and seeded 40 acres as a starter a year ago. This spring they plan to seed about 100 more acres to the same pasture mixture.

Along with their new pasture seedings, the Swan's Trail community has a program for building soil fertility. They believe they can restore the richness and productiveness of their lands by carefully following a planned fertilizing program.

Hay and pasture crops are getting 300 pounds or more of commercial fertilizer per acre. From 600 to 700 pounds per acre are applied on cash crops such as corn and broccoli. The ratio is 5-10-10—nitrogen, phosphate, and potash—depending on the type of crop.

Cash crops produced on drained Swan's Trail lands last summer grossed better than \$100 per acre.

Some of the leading participants in the Swan's Trail group-action movement are Lloyd Anderson, Ernest Bachart, Roy Mercer, Perry Porter, Samuel Thompson, Clarence Yesland, Stanley Krause, Leonard Tvengel, J. E. Haselton, and E. O. Staswick.

Today, Swan's Trail farmers can add their good drainage work to a long line of soil conservation developments carried out the last few years in Snohomish County.



This piece of land until recently was wet and sedge-covered. Thanks to drainage through a "neighborhood action" program sponsored by the Snohomish County Soil Conservation District, it is now in full cultivation. Here the furrows were being turned on the farm of Tennis Roeteiscender. W. C. Pettibone, SCS technician, chats with plow operator. Just the week before, a similarly drained area on the other side of the fence had been put into cultivation.

Wilbur C. Pettibone, in charge of the Snohomish SCS office, cites some of the group-action projects:

1. French Slough Flood Control District on east bank of Snohomish River, 122 farmers, 580 acres drained.
2. John Misich dike. Road raised between Snohomish and Lowell to serve as dike. Some 5,800 acres benefited, including 200 farms. Work keeps Snohomish River within bounds and prevents flooding of spring crops.
3. Stillaguamish River area, 50 farms, 877 acres protected from spring high water.
4. Marrayville Diking District No. 3, 400 acres, 15 farms benefited.
5. Snoqualamie Slough diking work keeps water off 1,500 acres, 5 farms. Work included installation of pumping plant, tide gates, and building of earth-filled dams.
6. Two projects completed in Snohomish River area protects 4,000 acres and 160 farms.

Meanwhile, Ted Beckmeyer, chairman, and the rest of the five-man governing body of the Snohomish district, say their 35 group-action projects are just a "forerunner" of many more to come.

COOPERATIVE PUSH.—Horace and Walter Lyman invited four neighbors to their home last spring to meet Soil Conservation Service techni-

cians who work with the Hampden (Mass.) Soil Conservation District. Things started to move in the Chester Hill area. Through use of land-capability maps prepared by SCS, the group became interested in having complete conservation plans. They pooled their resources to get the improvements on the land. Most of them needed better hay and pastures. This called for reshaping fields by removal of stone walls, boulders, and trees to permit more efficient use of equipment. A contractor was hired for the job. The SCS technicians made the plans and staked out the work, including land clearing, grass waterways, contouring, strips, improved forestry practices, and better management of hay and pasture lots. Completion of the work will require several years. The Lymans, Welcome Meacham, Roger Scott, Leon Kelso, and J. M. Sherwood are the cooperating farmers.

DEED FOLLOWS CONTOUR.—When an 80-acre tract was being sold recently from an estate in the Shiloh O'Fallon Soil Conservation District in Illinois, it was found that the usual rectangular shape would cause the new property line to cut across two terraces, making them practically useless. But both buyer and seller were cooperators with the district. They knew the value of conservation farm plans. So with some help from the SCS a land deal was made that was really "on the level." The buyer got several acres less land. The two terraces will stay on the job as they were originally planned.

SHRUB LESPEDEZA REQUIRES INSECT POLLINATION

By KARL E. GRAETZ

THE bees are among the bobwhite's best friends. That is because bicolor lespedeza must be pollinated by insects to set a useful crop of seed—a fact of importance to all who are interested in producing bumper seed crops of *Lespedeza bicolor* and the other perennial bush lespedezas.

For the past several years the Soil Conservation Service in the southeast has been carrying on a diligent search for an early-maturing bush lespedeza. *Lespedeza bicolor*, which is the “super food market” for quail in the south, reaches its northern range limit in Virginia and Kentucky. In areas which can expect a killing frost before October 15, bicolor does not furnish a dependable annual supply of food for quail. Thus, the birds living north of the dependable bicolor range seemed to have a legitimate complaint.

As far back as 1939, Verne E. Davison, regional biologist, took note of this unhappy state of affairs. He and L. B. Scott, chief of the regional nursery division, set up a project with the definite purpose of finding an early-maturing bush lespedeza which would extend the range of this plant farther north.

The first step was to bring together the most promising species and varieties. These included *Lespedeza japonica*, *formosa*, *intermedia*, *robusta*, and *bicolor* (natob). Observational plots of each were established at the SCS nurseries in Gretna, Va., Thorsby, Ala., and Paducah, Ky. An additional series was set up at the Virginia Polytechnic Institute, Blacksburg, Va., with the State Game Division cooperating. Here the plots are under the supervision of Dr. Henry S. Mosby, leader of the wildlife research unit, and Prof. A. B. Massey of the botany department.

At these locations the varieties growing side by side could be closely compared and evaluated. It was noted immediately that there was a considerable variation in the character of the individual plants even in the same species. This lack of uniformity seemed odd, as bush lespedeza was thought to be a self-pollinated plant in which mixing of



At left, pollinated branches of *lespedeza bicolor*; at right, unpollinated branches.

different characteristics from other species or varieties would be very improbable. We have, in fact, an observation made by A. J. Pieters in 1934. In his publication “The Little Book of Lespedeza” he stated: “While there is no experimental evidence, it seems probable that all lespedezas are largely self-fertile, and that there is little, if any, crossing between species and varieties.”

As time went on, many parent plants were selected for earliness in maturing seed. Along with earliness we also chose carefully for vigor, good seed yield, and for the persistency with which the seed clings to the branches. The seeds from each selection were planted in beds at the Gretna nursery. After one growing season we dug and replanted them in observational rows at all four stations. From there it became evident that some of the seedlings strayed from resemblance to their parent plant. We suddenly came up with a *japonica* that had the height and earliness of *bicolor*. We found *bicolor* which had the leaves and seed color of *intermedia*—and so on. Definitely, something was going on that we did not know about!

NOTE.—The author is observational agronomist, Soil Conservation Service nursery, Gretna, Va.

Accordingly, we studied the pollination of these shrubs in the summer of 1950. Three screen-wire cages were built. They stood on legs about 5 feet high. We picked out one well-developed shrub from each of three lespedeza species: *L. bicolor*, *L. japonica*, and *L. intermedia*. The cages were placed over these plants so that half of the bush was completely enclosed in the insect-proof screen cage. The other half was left in the open but underneath a screen awning. The awning gave the branches outside the same amount of light as those inside. None of the shrubs was in bloom when caged.

As the summer passed we noticed the bees (and other insects too) busily working the blooms outside the screening. Those flowers soon produced pods; while those inside the cage fell off, leaving practically all the stems bare. At the end of the season the unscreened branches of all three species produced a normal yield of seed. The actual number of these seeds was estimated to be between 3,000 and 4,000. The branches protected from the

insects produced exactly 14 seeds on the 3 plants. Those 14 seeds, negligible as they are for all practical purposes, still defeated a clear-cut, black-and-white result. It is probable that an ant or some other small insect got through the screens and blundered around inside until it had pollinated those few flowers. As a result we hesitate to make a specific claim (at least within earshot of those 14 seeds!) that bush lespedeza *must* be cross-pollinated. We *can* say that without the insects it is impossible to produce a good seed crop.

At any rate we have picked the feathers off the old idea that bush lespedeza does not depend on insects to make seed. The formerly accepted theory was born of the habit of lumping these lespedezas with the annual lespedezas which are self-fertile. *Lespedeza sericea*, playing it safe, has some flowers which depend on insects and others which do the job themselves.

The results of this study will cause us to alter our technique in seeking better selections. We have several which are better than our original stock, but as yet no one has found a plant which is tops in all four desirable traits: (1) earliness, (2) high seed yield, (3) vigor, and (4) persistency. However, it is easy to find two selections which together possess all the necessary features. Why not then plant these two next to each other to make the interchange of their pollen more probable? It seems logical to suppose that somewhere among the resulting progeny we shall find a blending of the desired characteristics. In the future we shall pay more attention to the actual location of each type selection in the observational rows.

Almost all of our agricultural practices today contribute to the destruction of wild bees and their habitat. Wild bees once performed most of the pollination task. Authorities agree that 80 percent of this work has now fallen upon the willing wings of the honeybee. Without a sufficient bee population those crops which depend on insect pollination will not produce maximum seed crops. The sportsmen, farmers, or seed producers who have bush lespedeza plantings of an acre or more should consider this factor. In cases where there are few bees it may be necessary to set up honeybee colonies adjacent to the fields. One colony to the acre should be the minimum.

We have had six colonies of honeybees at the Gretna nursery. Last spring these bees were moved away. During the summer I took particular note



Lespedeza bicolor planting involved in study of hedge suitable as source of food and shelter for wildlife.

of the insects working on the lespedeza blooms. Only an occasional honeybee could be found. At least 95 percent of all the pollination was done by wild bumblebees. Fortunately there seemed to be a great number of them. We have extensive wild and wooded areas surrounding the nursery, which furnish excellent habitat for these insects. Had we been in an area of more intensive agriculture with a low wild-bee population our seed crop probably would have declined.

Pollination should not present a problem to the average farmer who has a small bush lespedeza "food patch." Such small plantings can be readily pollinated by a limited number of bees. Then too, these strips are generally planted next to wild cover which furnishes a home for the bees as well as the quail.

So it turns out that the bee is one of the bob-white's best friends.

In the fall I, myself, enjoy tramping our bicolor strips to make threatening motions at Bobbie with a shotgun. As the wads drift gently to earth and every single member of the covey disappears in the distance, I am warmed by one thought—they might not have been there at all had it not been for our friend, the bee.

4-H CLUBS SAVE SOIL

(Continued from page 220)

mon farm trees and the savings effected by cutting instead of burning. The collection was loaned by Dr. Hugh H. Bennett.

Raymond C. Firestone, vice president of Firestone Tire & Rubber, summed up pretty well what 4-H'ers have already pledged to do. In his address he said, "The conservation of our land and the preservation of our liberty are two of the most important responsibilities that the coming generation must assume if our country is to remain self-sustaining and free."

The 4-H boys and girls—2,000,000 if you count them all—are indeed "serving their country by saving the soil."

ASSESSMENT SCALE.—Taxes on agricultural land in the Washington County (Minn.) Soil Conservation District may soon be based on land capabilities. Morrie A. Bolline, district conservationist, and Francis L. Paulson, farm planner for the district, have trained the county assessor in the interpretation of land-class information. A comparative valuation ratio has been tentatively worked out for each land class. Starting at 1.00 for Class I, the ratios range down to 0.045 for Class VII.

EIGHT FARMERS DRAIN LAND

By W. H. COLEMAN

THIS is a story of cooperation in the boot heel of southeastern Missouri, where drainage is a major problem in eight counties.

Drainage had supplied many a headache since the first settling of the land now farmed by John Deneke, William Deneke, John Thoma, Fred Thoma, Harvey Hoffman, Hubert Young, Walter Eggiman, and Norman Hager. These men farm the upper end of the delta between Dutchtown and White-water. Of the 10 farmers owning 1,210 acres in the watershed 8 decided to make a cooperative effort toward reclaiming their wet lands and improving drainage on the balance. None of these men by himself could obtain adequate drainage, because the natural watershed within which these farms are located had a common outlet, East Bean Branch, and the water crossed all the farms.

With help from the Soil Conservation Service and other agencies, working through their soil conservation district, these men now substantially have increased the total value of their farms by guaranteeing higher production and insuring full harvests. Two of the ten farmers did not participate but received benefits from the project nevertheless; the other eight were willing to furnish them free drainage in order to improve their own farms.

Their first step was to form an organization and ask assistance from their soil conservation district. The District Board of Supervisors, Ervin Hobbs, F. E. Jones, Elmer Schaper, Luther Cooper, and A. D. Arnhart, nodded approvingly and requested the Soil Conservation Service staff at Jackson to see whether the project was feasible.

After deciding on the practicality of the project, the technicians made a detailed survey. Drainage ditches were located and staked out and the yardage to be moved calculated. The main ditching job involved 5.1 miles and required the movement of 42,423 cubic yards of dirt.

The magnitude of the job was such that it at-

Note.—The author is district conservationist, Soil Conservation Service, Cape Girardeau, Mo.

tracted a lot of dirt-moving contractors. Individuals usually pay from 17 to 20 cents per yard for moving dirt due to the fact that it costs money to move draglines long distances for small jobs. Out of six bids received, a contract was awarded at 13.4 cents per yard!

While the main ditching job was completed January 1, 1951, a great deal of field ditching still remains to be done. In fact, on the eight farms these men will construct a total of 16.3 miles of field ditches varying in depth from 1 to 2½ feet, with 3 to 1 side slopes. The dragline ditches were much larger, varying from ditches 6 feet deep with bottoms 6 feet wide, and 2 to 1 side slopes at the outlet end, to ditches 4 feet deep with 4-foot bottoms toward the upper end of the drainage area. Field ditches will be constructed mainly with ordinary farm tractors over a period of years as the farmers can fit this job into their regular farm work. Blades, disk plows, and possibly whirlwind terracers will be used on this construction work, all of which have proved practical.

Let's consider for a moment the benefits derived from this job. The entire watershed, or drainage area, includes 1,090 acres, a small part of the watershed being hill land. Of this area, 1,014 acres have been directly benefited. Some 455 acres were not even fit for wildlife use because of intermittent flooding; most was wasteland. As a result of drainage a part of this 455 acres will be some of the highest-producing land in the whole project; crops on the balance of the 1,090 acres will be safe from flooding. After being drained, these 455 acres could now be valued at \$50 per acre, or \$22,750. Formerly the better land on these farms had to carry the tax burden on it. The value of the other 635 acres benefited has been increased approximately \$25 per acre, a total of over \$15,000. The over-all drainage costs for this job were \$11.48 per acre.

In letting the contract, these men did not stop with ditching alone but included the leveling of spoil banks. The contractor bid 4 cents per yard for this work. Thus, they can now farm right up to the ditch banks without having spoil banks taking up valuable land.

Payment was made by individuals on the basis of acreage directly benefited by the project.

All eight of these cooperating farmers now have applied for assistance from the district in working out complete conservation farm plans. Drainage

is just as important a soil conservation practice to these men as terracing is to hill farmers. In brief, before a good soil-conserving and soil-building rotation can be followed drainage must be taken care of here. These men want to go all the way and bring their farms into a high state of productivity and still maintain this high level to pass on to their children. Their conservation farm plans include soil treatments and proper rotations with better hay and pasture crops. These people are livestock men and all of this adds up to greater feed production, better livestock, and finally, better living—the aim of any soil conservation program.

The Production and Marketing Administration certainly helped on this job through incentive payments which took care of a substantial part of the dirt moving costs.

This project typifies how southeast-Missouri farmers who have been farsighted enough to organize soil conservation districts are solving problems common to most of them, using their districts as the medium through which they may obtain needed assistance.



FLOOD CONTROL EFFECTIVE.—When a face lifting was held at the Willard Spicer hilltop farm at Apalachin, near Owego, N. Y., in August 1949, a large pond was constructed sufficient to impound more than 5½ million gallons of runoff water, as a flood-control measure. Under normal conditions about 1½ million gallons would be held there. Following heavy rains last winter, the water was close to the top of a spillway installed to prevent flooding of a highway through the valley. Since then, after the valley stream has been reduced to normal flow, the impounded water has been slowly released through a 6-inch trickle tube. At the same time two smaller ponds, also built during the face lifting, have been holding back additional runoff from rain and melting snow. The ponds seem to be meeting every expectation of the technicians who designed them and supervised construction for the Tioga County Soil Conservation District.

ON KALAUPAPA, THE LAND, TOO, FINDS A CURE

By NORMAN K. CARLSON

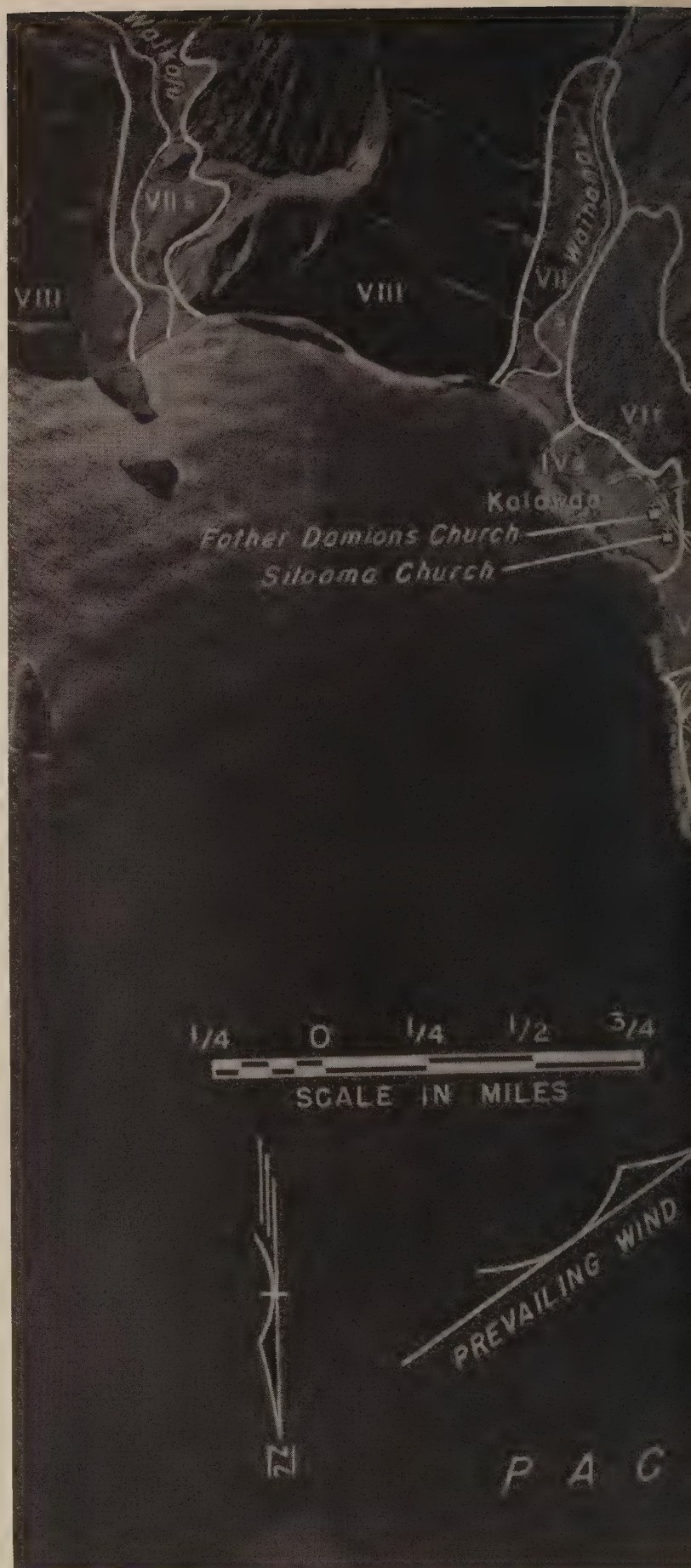
IN THE summer of 1949, the Molokai Soil Conservation District in the Territory of Hawaii received an unusual request for technical assistance. It came from Lawrence M. Judd, director of the Division of Hospitals and Settlements of the Territory. The request asked for a land-capability inventory and conservation plan for Kalaupapa, world-famed settlement for Hansen's disease (leprosy) patients.

The Molokai district accepted the application and asked technicians of the Soil Conservation Service to inventory the settlement lands and work out a long-time conservation plan which would insure the best agricultural use of soil and water resources.

This is the story of what we found at Kalaupapa and the recommendations we made for solving a land-use problem which dates as far back into antiquity as the once-dreaded disease of leprosy itself. Modern medical science has stamped out the stigma and fear formerly associated with Hansen's disease. Newly developed "miracle" drugs are now bringing full and positive cures. It is probably more than coincidence that modern science also has a "cure" for the ailing lands on which the afflicted people of Kalaupapa have lived and died for nearly a century.

Our conservation survey and ranch inventory of the settlement lands revealed only a limited area which could be cultivated. These lands had been abandoned for many years and were grown up to trees and brush 15 to 25 feet high. The survey of the dry-land pastures showed overgrazing, continued year-round use, very little feed, and invading, unpalatable brush. Cattle which once had been of average quality had degenerated into definitely inferior animals.

NOTE.—The author is district conservationist, Kaunakakai, Molokai, T. H.



Aerial view of Kalaupapa peninsula, with land capability classes indicated; it shows clearly why the world-famous leper colony was unable to become self-sufficient



in food production. Note that there are only a few tiny areas of Classes II, III, and IV land suitable for cultivation. Most of the land can be used properly only for

grazing, and this only under the most careful conservation management. Towering cliffs separate the peninsula from the Island of Molokai proper.

The low, rocky peninsula on which the settlement is located juts out into the Pacific Ocean on the north side of the Island of Molokai. The peninsula seems a geographical afterthought. It was developed long after the earlier volcanic action which created the land on Molokai proper. Originally the peninsula was called Laupapa by the Hawaiians, but later the name was changed to Kalaupapa.

In 1864 the Hawaiian King, Kamehameha V, urged the legislature to take steps to control Hansen's disease, known then as "mai pake" (Chinese sickness). Rev. Dwight Baldwin, a medical missionary who was a member of the board of health at the time, suggested the peninsula as a site for a leprosarium. A site was chosen for headquarters on the east side of the peninsula, but it proved too cold and wet. The town site and hospitals were moved to the warmer and drier west side of the peninsula.

Homesteaders living on the peninsula at the time were granted land elsewhere in the Territory, and in 1866 the first of the afflicted people were brought to the peninsula. At first, those who came were regarded as outcasts and told to produce their own food. The general thinking was that the Government did not want to be burdened with them.

Poi, a starchy derivative of the taro plant, which is a member of the arrowroot family, was the principal food. Originally, there were a number of small cultivated fields established on the peninsula's spots of better soil and in the valleys of Wailau and Walkolu, extending back into the Island of Molokai, for the production of taro and small amounts of other native crops.

The colony grew rapidly to nearly 700 people. To feed this number required intensive use of the lands. Many of the people were not physically able, or experienced in growing crops; others were despondent and did not wish to assume agricultural responsibilities. Consequently, the lands were neglected or poorly farmed. Changing tastes and eating habits over the years influenced the diet and food requirements for the settlement. The taro lands were abandoned more than a decade ago to the invasion of aggressive brush plants such as lantana, guava, and other exotics.

Changes in native diet and the continued arrival of new patients who were accustomed to a greater variety of food than that supplied by poi and fish caused the administration to cast about for new

foods. Dairy cattle were brought in as a trial, and for a time milk was made available to the residents. But milk was not wholly acceptable to the majority of patients and in time the idea was abandoned and the dairy cattle allowed to roam at will. Beef cattle were introduced in the belief that they would require little care and need little feed—they could roam, feed, breed at will, and meat on the hoof would always be available and acceptable. Horses, no longer used for farming, were also allowed to roam at will and their numbers increased. There were no fences to control the animals. With increased numbers of animals, the land was soon overgrazed, and the unpalatable brushes soon covered most of the peninsula.

It was difficult to get animals fat enough for slaughter, with the result that there was little production of meat. Beef had to be shipped to the settlement to meet food requirements.

It never really gets cold on the peninsula. The temperature seldom drops below 60°F., but during the winter the winds and rains on the east coast can be very uncomfortable. Rainfall varies from less than 30 inches a year on the tip of the peninsula to over 100 inches at the head of one of the valleys that bisects the cliffs and reaches back into the Island of Molokai proper.

The rains fall mainly throughout the winter months. In the valleys, especially in Walkolu valley, rains fall every month of the year. Trade winds blowing from the ocean are constant and sometimes heavy. Salt for cattle, for example, is constantly present on rocks and shrubs from the evaporation of spray from the ocean.

Livestock fences are not required around the boundary of the settlement, for three sides of the peninsula are bounded by the ocean and the fourth side consists of 1,600- to 2,000-foot cliffs. These cliffs effectively isolate the settlement from the main part of the Island of Molokai.

The soil conservation survey of the settlement lands included a condition classification of the vegetation. This proved a difficult task in many parts of the peninsula because of the wilderness of invading trees, brush, and weedy plants and because much of the land is strewn with rocks, boulders, and rock walls. In order to map accurately some of the area, it was necessary to use a bulldozer to make a path through the jungle.

The fringe of land near the shore around the peninsula was found to be rocky and sandy and un-



Typical result of heavy, unregulated grazing. Desirable forage species are gone. Only crabgrasses and carpetgrasses remain, which furnish little feed for livestock. The cattle here are of mixed dairy and beef breeds which never fatten enough for slaughter. Area will be reseeded to more palatable and productive grasses.

suitable for agriculture. The cliffs and volcanic crater were also classed as non-agricultural land. In the past these cliffs were heavily wooded, but due to the presence of a large number of goats the trees were destroyed, and now the watershed is less able to condense the frequent fogs and hold water. Some of these cliffs are actively eroding.

From the lighthouse on the outer point to the crater near the base of the peninsula the soils are shallow, rocky, and, on the easterly side, wind-swept. These lands are classed as VII; while they could not be cultivated, they could produce grass. On much of this land lantana (a native brush about 2 feet high) covers the ground so closely that the grass has little chance to grow, and even less chance to reproduce and spread due to competition by the brush and heavy continuous grazing. On the northeast side, at some distance from water, we found

some range in fair to good condition. Bermuda-grass covered the ground and furnished fair feed. In places, guineagrass was growing on steep slopes where brush protected it from heavy grazing. Ekoka, a valuable, palatable, leguminous shrub, was growing in the rocks where cattle and horses couldn't reach it. These lands properly grazed could produce many times their present forage.

On areas of range land, classed as VII land, fringing the cliffs, the land was taken over by heavy brush. There was practically no grazing here, due to the large rocks and heavy brush. Economically, little can be done to restore these areas to forage-producing plants.

On the north side of Kalaupapa road is a large area of fairly deep, medium-textured soils which we classed as fairly good range land. Lantana,

guava, java plum, and other brush species were so thick and rank it was not possible to examine the soils except when a bulldozer preceded the survey party. Rainfall here is over 40 inches annually and falls about 9 months of the year. This area shows great promise as a grazing area when cleared and seeded to adapted grasses. It is estimated that these lands, restored to good grass, would carry one head year-long on each 4 to 6 acres.

Rainfall in the better Class VI range land south of the road is even greater than to the north, but the brush is heavier, thicker, and higher. Forage yields following extensive clearing and reseeding would be high, but the costs of preparing the land for reseeding would also be high.

The land on which the settlement is located was classed as IV. This is a gravelly, rocky, light-textured soil, fairly deep, slight slopes. Most of this area is used for buildings and gardens. There was a fine growth of ekoa here—a legume roughly equivalent to alfalfa in feeding value. Ekoa grows wild, thick, and, when well-managed, reaches heights of 12 to 20 feet.

South of Waihanau stream and on the west side of the peninsula, about 50 acres of good deep, medium-textured soil, almost free of rock, was found. This is the best soil on Kalaupapa and is in a 40-inch-plus rainfall belt. In years past taro was grown here. Many of the terraces are still intact. Again a bulldozer was required to make a path through the jungle of guava, lantana, java plum, Christmas berry, and other aggressive but worthless shrubs that covered old fields. This area will be the first to be cleared and reseeded to forage grasses.

Along the road across the peninsula and south and east of the crater, some Classes II, III, and IV lands were found. This land, now covered by brush, was formerly cultivated. About 80 acres of it will be cleared and planted to good pasture grasses and legumes.

East of the crater and on both sides of the road, we found an area of fairly deep, gravelly soil of 10-percent slope. When cleared and seeded to adapted grasses, it should make excellent pasture. Remnants of old taro fields and terraces were found on this land. Brush had not yet covered it all. We classed the range as fair, due to the density of less-desirable weeds, carpetgrass, and crabgrasses. The livestock concentrate here at certain seasons with the result that range plants do not

have a chance to set seed, develop an adequate root system, or grow new plants.

From the settlement churches east to the ocean is another area of Class IV, potential pasture land similar to that just mentioned. Some of this land can be reworked and replanted. Some will be left as a recreational park. The widely known Father Damien Church is now surrounded by a small patch of Napier-Merker grass 9 to 12 feet high and so thick it is almost impossible to cross. Most of this pasture area can be made to produce Napiergrass instead of the less-desirable carpetgrass and crabgrasses which now cover the area.

The three large valleys formerly used by the people of the settlement will not be rehabilitated for grazing, even though the soil and weather permit. These will be left as watersheds to supply better water for the lower-lying lands.

With the foregoing information in mind and the desire of the settlement administrator to improve and maintain the agricultural land of the settlement, the inventory data were analyzed and a conservation plan was developed which provides a number of remedial measures and management practices:

- a. Reduce the present herd of 300 nondescript cattle to 40 breeding cows and 2 bulls.
- b. Reduce the horse population of about 80 head to 4 to 6 head of work horses.
- c. Remove brush from Classes II, III, and IV lands. Follow by cultivation to establish adapted pasture species for feeding and fattening stock.
- d. Remove brush from Classes VI and VII lands, and seed to adapted grasses and legumes.
- e. Divide the range into units to permit a deferred rotation system of grazing. Use rock walls and natural barriers, where they occur, to keep down expenditures for fencing.
- f. Keep bulls separated from cows except during the planned breeding season (March and April).
- g. Develop about 10 acres of irrigated pasture. This pasture can be used in critically dry times. There is a considerable overflow from the storage tanks on the Kalawao-Kalaupapa road during the summer and this water can be used for irrigating the pastures.
- h. Plant guinea, Bermuda, Alta fescue, Harding, Paspalum, and other grasses and le-



Father Damien Church, glimpsed at right, is surrounded by a trial planting of Napier-Merker grass, a forage species which figures prominently in Kalaupapa plans. When protected from grazing, this grass attains a height of 9 to 12 feet. David Akana, farm adviser of Hawaiian Extension Service, stands in harvested portion of plot.

gumes such as the local ekoa and Spanish clover.

- i. Establish small-fruit and vegetable fields on limited acreages on the better lands near the settlement.

With the initial reduction in horses and cattle and the subsequent improvement of range and pasture, the final sustained-stocking figure should

reach 100 breeding cows, capable of producing 90 high-grade beef calves each year.

The conservation plan was accepted by the settlement administration and the application of improvement measures has begun.

It is perhaps ironic that science mastered leprosy at Kalaupapa before it found a "cure" for sickness of the land which, throughout the cen-

(Continued on page 239)

WHAT MY SOIL CONSERVATION DISTRICT HAS DONE FOR ME

By JUDGE W. E. RICE

WHATEVER any soil conservation district does for anyone is in direct proportion to what he does for himself. Hence, the use of the term "cooperator."

As a district cooperator, I began to see the worth and effect of the Noble County (Okla.) Soil Conservation District with a visit to the farm (an ordinary quarter section of soil-depleted eroded upland) by the work unit conservationist, Ivan F. Dilley, in September 1945. Together, we went over the place, area by area, and then and there sat down and drew up a plan of operation for soil and water conservation, crop rotation, and land use. All accepted practices seemed to be called for—terraces, outlets, pond building, tree shelter belts, soil tests for lime and phosphate, legumes, native grass seeding, and pasture management for production of small grain, poultry, and livestock.

Between the beginning and the completion of the plan, have been experienced the usual ups and downs incident to weather extremes ranging from excess rainfall to drought. Suffice it to say that the principal obstacles now have been overcome fairly well and the farm is on a maintenance basis.

In carrying out the plan of operation, the district has furnished the use of grass drills, phosphate spreaders, and terracing equipment. It has supplied at reasonable prices rock phosphate, native grass and legume seed. With the assistance of SCS technicians, we have completed 21,648 feet of terraces, put all cultivation on the contour, established 95 acres of sweetclover, and 38 acres of native grasses. Also installed are a 3-acre windbreak and wildlife area with trees from the district, a pond for stock water and garden irrigation, pastures improved by proper stocking and overseeding. Fertilizers and lime have been applied to cropland.

We have had more garden truck than we could use and the income from the farm is increasing each year. In the past year there were produced and sold off the land \$1,200 worth of cattle, \$150

worth of hogs, \$200 worth of poultry, \$1,000 worth of eggs and cream, and \$1,200 worth of wheat.

This, then, might be considered "what my district has done for me." In a material sense, so it is. But in a larger sense, this one unit of operation is just a sample of a vast and ever-growing amount of work performed and applied on the land in conformity with scientific practices as opposed to traditional procedures. My district, together with other districts throughout the State and Nation, does for me and an army of cooperators something else of tremendous importance. It is an action program by farmers themselves. It strengthens the principle of democracy. Individual farmers are more prosperous. Community conditions are improved. One of the most important links in the chain of national defense is welded more secure.

The Noble County Soil Conservation District was one of the first districts to operate on the neighborhood group plan. How well that plan works is evidenced by the selection of the district's technical staff by the Secretary of Agriculture for a special certificate of award in the year 1950—one of but two such awards made last year in the United States. My district has made available to me the very best of technical assistance. Finally, my district has given me a fine sense of being a part of a work that is fine and constructive.

As a district supervisor, I have had an opportunity to become acquainted not only with the problems of our district but also to obtain inspiration from attending each State association meeting from 1945 up to now, and each national convention since the one held at Des Moines.

Men of good will—how many of them I have seen at these meetings!—such stalwarts as Christy of Kansas, Heidrich of West Virginia, Threlkeld of Kentucky, Williams of New Mexico, Hall of Georgia, Boswell of Texas, Leavitt of New York, Tossett of North Dakota, Fuqua of Oklahoma, the Right Reverend Monsignor Hildner of Missouri, the late McArthur of North Carolina, and supervisors by the score from Maine to California and from the Piedmont to the Palouse. Special recognition is due our own supervisors of Oklahoma.

In this time of dollar consciousness, they perform their official duties without compensation. They have attended innumerable meetings at places distant from their homes at their own expense. They have not failed to answer present in every roll call in the ranks of public service.

What my district has done for me, your district can do for you. In my opinion a soil conservation district opens up a genuine philosophy for living and can be summed up in a sentence: He who makes some constant contribution to the forces of life in some measure justifies his existence.

NOTES FROM THE DISTRICTS

FATHER HILDNER HONORED.—The Right Reverend Monsignor George J. Hildner, pastor of St. John's Church, Villa Ridge, Mo., was named Optimist of the Year (1950) by the Optimist Club of Washington, Mo.

Father Hildner is credited with having been largely responsible for the establishment of a soil conservation district in Franklin County.

SURVEYS PROVE LAND VALUES.—Edward Connell, cooperator and supervisor in the New London County (Conn.) Soil Conservation District, has found another good use for his conservation survey map. Believing that the valuation and tax assessment on his farm were too high, he took the map to the board of assessors and showed them the actual soil conditions on his farm. He says it took less than 5 minutes to convince them that the valuation should be lowered \$2,000. He believes that conservation surveys should be used as a basis for determining land values.

MORE WIDELY READ.—The foresightedness of a bank in Elmer, N. J., which sponsors subscriptions for the second straight year, has resulted in 1-year extension of subscriptions to SOIL CONSERVATION Magazine for 29 farmers in the Salem County work unit and new subscriptions for 10 others. It is reported that the publication is gaining popularity in the district and that more subscriptions will be purchased later this year.

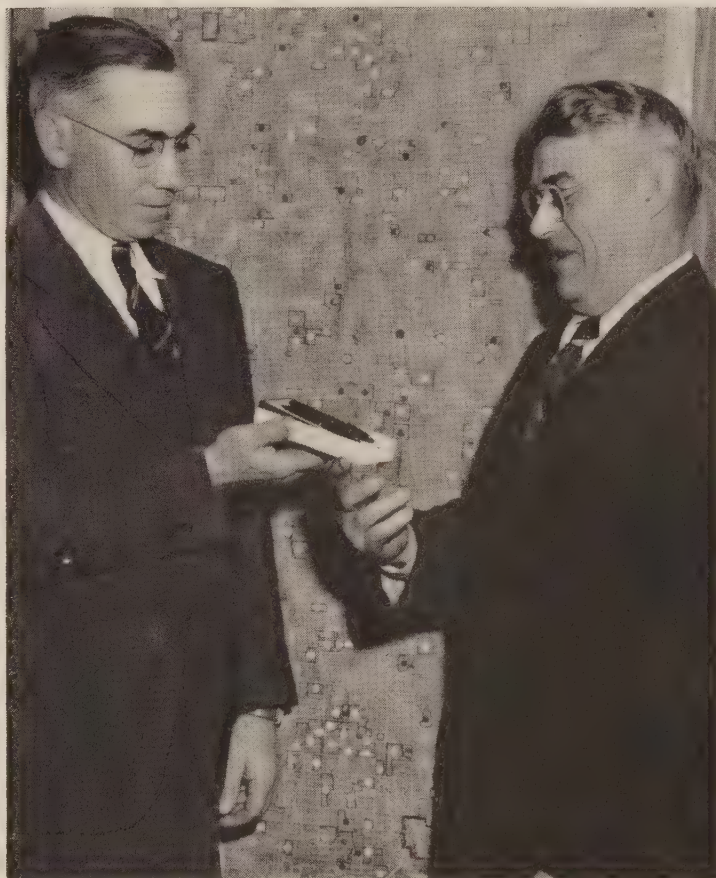
CAN ANY DISTRICT TOP THIS?—Joseph Cowen just recently retired from the Ashland (Ohio) Soil Conservation District Board of Supervisors after having served about 6½ years. He was a member of the first board, organized in June 1944. Regular meetings are held each month, with occasional special meetings. Joe attended 78 con-

secutive meetings, not missing one during his entire term of office. In doing this, he traveled approximately 3,000 miles at his own expense. In addition, he attended many State conventions, and one national convention in Georgia. He served as chairman 1 year.

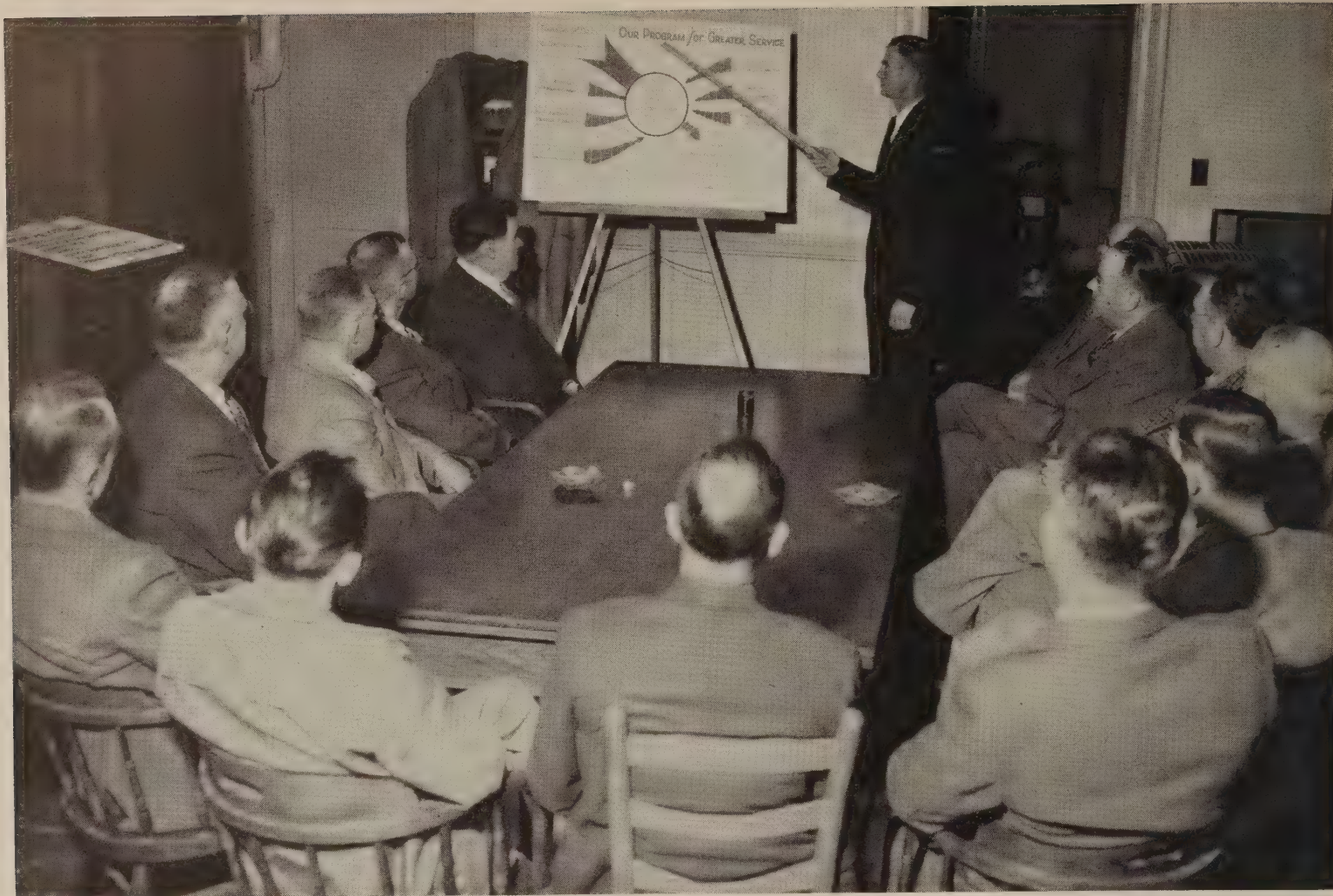
Joe started his conservation program on his farm in 1938, in cooperation with the CCC camp. At that time his corn yield was only about 20 bushels to the acre. By following good practices, he has jumped this to over 90 bushels per acre, with other crops improved accordingly. All of his cropland is strip cropped. He uses plenty of lime and fertilizer. He has excellent meadows, and plenty of Ladino-alfalfa-bluegrass pastures. His beef cattle receive very little grain, except for finishing. He has about 10 acres of pine planting, as well as a native woods, which he protects from livestock and manages according to good forestry practices. He was honored in 1942 by the Cleveland Farmers Club as having done an outstanding job in soil conservation and restoration. He really practices, as well as preaches, soil conservation.

All members of the board of supervisors of the Ashland district are unusually faithful in attendance at meetings. Several other members have 100-percent records but have not served so long as Joe. The attendance of the board as a whole is better than 92 percent.

—T. C. KENNARD.



Joseph Cowen (right) handed pen-and-pencil set by Harold Obrecht. It was given by other board members and SCS personnel in recognition of long and faithful service.



W. B. Wilkerson, supervisor of Catawba Soil Conservation District, discusses program for greater service with supervisors from South Carolina work group 3, Chester, S. C.

WIDENING THE SCOPE.—District supervisors of South Carolina are enlisting the active support of all interests and all groups in their soil conservation district program. Here W. B. Wilkerson, a supervisor of the Catawba Soil Conservation District, is shown discussing a Program for Greater Service at a meeting of supervisors at Chester, S. C. The Program for Greater Service, initiated by the National Association of Soil Conservation Districts, is designed to give all farm and urban groups an opportunity to help speed district work. Five committees, each with a supervisor as chairman, and with businessmen, educators, farmers, and others as members, are being set up in each district. These advisory committees will aid the district board with problems of finance, program, education, legislation, and publicity. In South Carolina, Joe B. Douthit, president of the district supervisors association arranged a series of small group meetings of supervisors to discuss and set in action the Program for Greater Service.

TWO CROPS NOW.—For years Chester Lidberg had been unable to get any agricultural use of 20 acres of deep muck land at his dairy farm near Lexington, Mass. Soil Conservation Service tech-

nicians working with the Middlesex County Soil Conservation District told him the land could be made productive. Starting in 1948, drainage was established as part of his complete conservation plan. In 1950 he realized a substantial return on his investment when he grew two crops of lettuce, broccoli, and cabbage on the reclaimed soil, now ideal for market gardening.

WATERFOWL HAVEN.—In cooperation with the New York State Conservation Department and the Federal Wildlife Restoration program, SCS technicians, working with the Oneida County (N. Y.) Soil Conservation District, are helping the Point Rock Fish and Game Club turn a 6-acre pond and marsh into a haven for migratory waterfowl, principally ducks and geese. The work is being done as part of a complete conservation plan for the club's property. Under an agreement with State and Federal agencies, club members will not shoot ducks at the pond during the next 5 years. The project, started 2 years ago, includes the planting of 30,000 trees and cover and feeding stock for wildlife, and the damming of a stream to create better fishing grounds. The club has a membership of 300 men.



DISTRICT OFFERS SCHOLARSHIP.—Supervisors of the Fountain Valley (Colo.) Soil Conservation District will award a \$350 scholarship in soil conservation education to a senior from an accredited high school within the district, according to Clarence Foster, chairman of the board.

The award will be made at commencement exercises next June, and all candidates must agree—if successful—to enroll in soil conservation courses that will lead to a bachelor of science degree at Colorado A. and M. College at Fort Collins.

The district supervisors will select the winner. Scoring will be on the following basis: written examination, 20 points; interview by supervisors, 30 points; achievement record in actual soil conservation work or in preparing a conservation plan, 25 points; high-school scholastic record, 15 points; personality, honesty, initiative, dependability, accuracy, neatness, etc., 10 points.

February 15 was the dead line for filing applications.

MILEPOSTS OF PROGRESS.—There are plenty of signs today that farmers in the San Felipe Soil Conservation District in San Benito County, Calif., are gaining ground in soil conservation.

Here are a few high spots: Four additions to the district acreage have been voted in the last 2 years. A petition to extend the boundaries a fifth time is now being circulated.

The conservation work Hugo Schmitt has put on his land is a good example of how farmers are advancing under the district's program of assistance. He leveled 170 acres and seeded them to a permanent pasture mixture. He has wells for both irrigation and stock water. "Soil conservation," says Schmitt, "has been a big help in improving my land."

Another cooperator, Fenton O'Connel, installed more than a mile of main and lateral sprinkler lines to improve water application on rolling land which was not suitable for border-check irrigation.

SIX-POND DAIRY FARM.—Raymond A. White, a district cooperator, has built six farm ponds as part of his conservation plan. White operates New England's largest dairy farm, more than 800 acres, at Acushnet, Mass. The largest pond holds 8 million gallons and has a maximum depth of 24 feet. Fed by springs, small streams, artesian wells, and surface runoff, the ponds impound water useful for irrigating pastures and other grassland for a herd of 550 cattle.

When there is a drought, as in 1949 and 1950, a crew of dairy workers moves from pond to pond getting water on the grassland; a supplemental irrigation system includes a portable pump and 5,000 feet of pipe, plus a system of small canals.

White cleared large acreages of rock, brush, and trees, and reclaimed soggy and otherwise idle wet ground that now produces an abundance of forage and silage. He is making full use of strip cropping, diversions, waterways, and outlets. From milking machines and barn cleaners to bulldozers that chop and load clover and alfalfa, the White farm is almost completely mechanized.

FEWER LOSSES FROM FLAMES.—The rapidly expanding importance of farm ponds for fire protection is demonstrated in the 1950 annual report of Chief Charley Kellogg of the Benson, Vt., fire department. The chief and a staff of 15, including the telephone operator, with an alarm system, a 1½-ton truck, fire pump and booster tank, a portable pump, 4 pack pumps, 2,291 feet of hose, 9 nozzles, and some small miscellaneous equipment, have the responsibility of protecting 189 homes and public buildings from flames. Ninety-nine of these structures are protected by 38 farm ponds, mostly small dugouts. Twelve of the ponds are along the highway. The average pond capacity is 63,200 gallons, and the average cost of construction was \$75.84.

Among structures not protected by farm ponds, 19 are located where water is available from a river, 2 are near quarries, 3 are accessible to non-farm ponds, 4 get water from lakes, 2 from reservoirs, and 1 from a well. More than 50 structures have no water, or insufficient water.

Benson is in the Poultney-Mettawee Soil Conservation District, in which 23 farm ponds were built in 1950. Seventeen of the fifty-five in the area are where water is not accessible for fire protection.

Information vital to the protection of each of the 189 Benson structures has been separately compiled by the fire chief. It shows where the nearest water supply is, its distance from the structure, how far the structure is away from department headquarters, and whether the supply of water is accessible to the fire truck at all times. A separate listing of farm ponds shows capacity, distance

from structure, distance to highway, and location with reference to structure.

Last year Benson's department answered 14 alarms—5 chimney fires, 4 where structures were ablaze, 3 grass fires, 1 tractor and 1 tree fire. Losses on four properties amounted to \$555.

"Farm ponds do a great fire-protection job. Without them we'd be almost helpless," Chief Benson says.

MISSOURI TREND.—Alta fescue produced 81 pounds of beef per acre last December while Kentucky bluegrass produced only 22½ pounds under the same conditions, reports Darnell Whitt of the SCS erosion experiment station at McCredie, Mo. The prairie soils at the station are only medium in fertility with a tight, impervious subsoil.

The growth from the 5-acre plot was an accumulation since the hay was cut early in August. Earlier production from the plot in 1950 included 471 pounds of fescue seed and 1.64 tons of hay per acre. Ammonium nitrate was applied at the rate of 100 pounds per acre in the spring and again in the fall at the same rate. Potash and phosphate were also applied as required.

Southeast-Missouri farmers are rapidly expanding their acreage of Alta fescue.

PARTNERS ON THE LAND.—Cooperation between the staff of the Kentucky agricultural training program for veterans and technicians of the Soil Conservation Service has greatly increased the efficiency of both agencies.

E. P. Hilton, director of agricultural education for the Kentucky division of agricultural education, recently wrote H. K. Gayle, State conservationist that about 25,000 veteran trainees are enrolled in the institutional on-the-farm training program in Kentucky. This represents a relatively high percentage of the farmers in the State, he pointed out.

"The vocational agricultural people cannot do the job alone," Hilton explained, "but with the help we have had from other agencies we not only have been able to do a better job of teaching but we have been able to assist other agricultural agencies in their work.

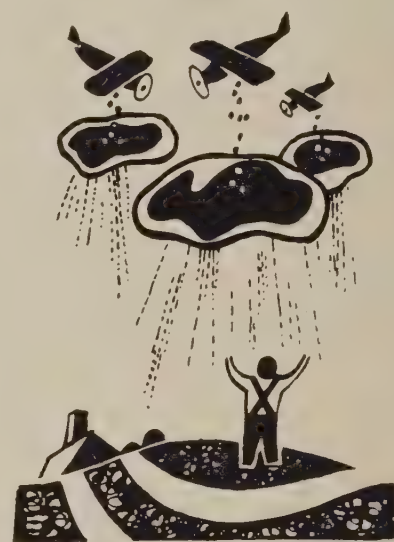
"I believe the relationship between the Soil Conservation Service and the staff in vocational agriculture can well illustrate this cooperative relationship and mutual help. I know the boys in our training program have much better conservation plans and have been able to carry out a better program of conservation practices than would have been possible had we been working alone.

"By the same token, I believe that our teachers have been able to help the Soil Conservation Service personnel in carrying out soil conservation practices in the soil conservation districts. After conservation plans have been worked out with the

teacher, the farmer, and the conservationist, the teachers are in a position to supervise closely the carrying out of the practices, in cooperation with the conservationist.

"We hope the teacher has been able to save the time of a conservationist by being on the job twice a month to check with the trainee on routine matters and thus make it unnecessary for the conservationist to visit the trainee as often as he otherwise would. This enables the conservationist to give his time to more people in the district. In the end, the efforts of our teachers and the soil conservationists are supplementing each other, rather than being a duplication of effort.

"It is our hope that this cooperative effort can be continued and expanded in the interest of rendering maximum service to our farm veteran trainees and to agriculture in the State of Kentucky."



"CLOUD-SEEDERS" ORGANIZE.—"Everybody talks about the weather, but we do something about it!" was the official slogan of a meeting in Denver in January when representatives of 10 non-profit groups sponsoring "cloud-seeding" programs in Colorado, New Mexico, Wyoming, Oregon, and Washington met to form a national association.

The meeting was called by Jim Wilson, landowner and agricultural writer of Fort Collins, Colo., who was named secretary and news-service chief of the new organization. Wilson, who is a member of the Explorers Club of New York and author of the book, "Three-Wheeling Through Africa," is also a director of the Northeast Colorado Water Development Association, a weather-improvement project covering 8,300,000 acres in the seven northeastern counties of Colorado.

The new group will be known as the National Weather Improvement Association. Other officers elected at the Denver meeting include Harvey Harris, rancher of Sterling, Colo., president; Oliver Dilling, Connell, Wash., wheat grower, first vice president; Albert Mitchell, rancher and past president of the American Livestock Association of

Albert, N. Mex., second vice president; Don Aldrich, Eads, Colo., rancher and farmer, third vice president; and Glenn Saunders, Denver Water Board attorney, treasurer.

Main speaker at the meeting was Dr. Irving P. Krick, well-known meteorologist and president of the Water Resources Development Corp., of Pasadena, Calif., who spoke on the remarkable advances made during the last few years in the field of weather control.

Wilson emphasized that the national association is strictly independent of all commercial companies doing cloud-seeding work, but that it will cooperate with all of them.

"Our purpose," he said, "is to insure that these weather-improvement developments proceed in an orderly fashion and that this great new force is directed into constructive channels for the best interests of the whole country."

The statement of policy of the new organization, framed by Leo Horrigan, Prosser, Wash., wheat grower, includes the following points:

"We believe that a program of artificial nucleation and weather-and-crop research can be of immeasurable benefit to many areas in the promotion and development of their economic, social, and moral welfare.

"We favor the development of proper and constructive regulation through legislative action as facts become available, so as to provide orderly and continuing progress in the field of weather improvement. We recommend against, however, hasty and ill-advised legislation without proper scientific background.

"Believing that weather-improvement programs are a common trust and should be developed in such a way as to provide the greatest good for all concerned, we further believe that no one group, whether or not engaged in such a program, has the right to ignore the well-being of any other group, but each has the duty and responsibility so to conduct its acts and operations as to insure the maximum benefit for the people of the locality, State, and Nation."

Mr. Horrigan, who is president of the Horse Heaven Water Development Corp., told the convention of the weather-and-crop research project on his wheat ranch near Prosser, sponsored by the Big Bend, Horse Heaven, and Tri-County weather improvement groups.

"We're learning," he said, "how to use long-range weather forecasts to plan our farming operations as much as 8 months in advance. For instance, if we know how much it's going to rain next year, we should be able to tell how thick to plant our wheat, what variety to plant, how much fertilizer to use, whether to summer-fallow or not, and many other things. We're pioneering a brand-new science." He suggested that other weather-improvement groups sponsor similar projects for their areas.

"In our area," said Ralph Crum, of Ione, Oreg., president of the Tri-County Weather Research Association, "the effect of artificial nucleation in smoothing out the storms and spreading the rain was even more important than the 4 or 5 inches of extra moisture we got. We usually get a lot of runoff with our rains. This fall we had almost none. For the first time in years, we had no floods or cloudbursts, no erosion, and no damage to roads, irrigation structures, or private property."

Mr. Horrigan told of two storms of the same type that took place on his ranch within 2 weeks. The first was seeded—the second wasn't. "The seeded storm," he told the group, "gave us a gentle, even rain over the whole area. The other produced only about .02 inches of rain at our ranch house, but when I went down to the lower end of the ranch, I found everything under water, crops ruined, and half a mile of road washed out that cost the county several thousand dollars to rebuild. Next time a storm like that comes up, you may be sure we will seed it."

KALAUPAPA

(Continued from page 233)

turies, has caused mankind far more suffering and misery. The population of Kalaupapa is now down from a high of nearly 700 people in 1881 to less than 300. Of this number, some 60 former patients are actually free to leave, but remain by choice. The need for food is far less urgent than a half century ago. It still exists, however, and farsighted settlement officials are well on the way toward restoration of the land to maximum production through soil conservation.

SOLDIER WRITES TO SOLDIER.—Out of Korea—new scene of heroic exploits—came word last fall of the award of the Distinguished Service Cross, by direction of the President, to Lt. Col. Gilbert J. Check, First Battalion, Twenty-seventh Infantry Regiment, Twenty-fifth Infantry Division, for "extraordinary heroism in connection with military operations against an armed enemy on 2 August 1950, at Chindong-ni, Korea."

Colonel Check's story was told subsequently in *The Saturday Evening Post*. His unit was attacked by overwhelming numbers of troops and tanks, which penetrated his positions and seemingly made defeat a certainty. The colonel's calm direction of defense, and his personal bravery, rallied his comparatively green troops and forced the Reds to retire.

From 1938 to 1941 this officer worked in Washington for the Soil Conservation Service. In a long letter replying to congratulations sent by his former chief, Hugh Bennett, Colonel Check writes, "I often think of my many friends in the Soil Conservation Service and of the splendid things you and your Service are doing for the Nation."



Contouring of fruit trees in South Wind Orchard, near Dakota, Minn. Greater ease of working is claimed for this arrangement, as compared with straight rows up and down hill. Sod culture is used between rows. The photographer is W. H. Lathrop.



June 1951

Soil Conservation

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION •

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

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☆ THIS MONTH ☆

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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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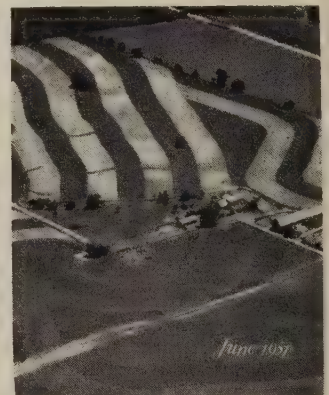
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MAGAZINE WITH MISSION.—Directors of the Allegany Soil Conservation District have put Allegany (N. Y.) County bankers on the receiving rather than the lending end of a transaction. They have just presented each bank with a year's subscription to SOIL CONSERVATION Magazine. Because Allegany bankers help many cooperators finance establishment of soil and water conservation practices on their land, Chairman Hugh Chamberlain says, "We thought it would help them keep current in soil conservation district and Soil Conservation Service developments." The district also pays a subscription for every school in the county.

NEW SUBSCRIPTION RATES

By order of the Superintendent of Documents, the subscription price of this magazine will be changed with the July 1951 issue to \$1.25 a year domestic, \$1.75 foreign, 15 cents single copies. This increase will be the first in 16 years of publication.



FRONT COVER.—Taken a year ago by Dick Burwell, this photograph is of contour strips laid out in a unit system. The upper unit is in corn and meadow strips, the lower unit in wheat and meadow strips. The owner of this farm is Albert D. Yoder, Holmes County, Ohio.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

FULL STATURE REACHED BY NATIONAL ASSOCIATION OF SOIL CONSERVATION DISTRICTS

By WELLINGTON BRINK

A NEW idea is rolling across rural America, gathering force and momentum as it rolls. It is penetrating every valley, hill, and prairie. It is reaching the cattle country, and the cotton and corn belts. It is pressing on the orchard lands, and the places where sugarcane and rice and truck crops grow. You can hear and feel its thunder a thousand different ways. Everywhere—as a result of this new idea—the earth today is getting greener, fresher, more resplendent. And everywhere men's minds and hearts are quickening and strengthening with a zeal which comes from meeting and embracing democracy at one's own pasture gate.

In Oklahoma City last February 20-23, I saw this idea—the concept of soil conservation districts—put on display by more than two thousand men and women from farms in every State of the Union during the fifth annual convention of the National Association of Soil Conservation Districts. In many ways this was an important historical occasion. Most of all, I think, this convention marked the attainment of ripe maturity by the soil conservation districts movement—a rural development without parallel in the annals of civilized man. Here was a meeting of farm leaders, men and women accustomed to exploring broad horizons, statesmen of agriculture in every way competent to represent their home communities. The Association carried to its work a consciousness of national responsibility and a prestige heightened as a result of having been listened to in the recent streamlining of soil conservation work in the United States Department of Agriculture.

Waters S. Davis, Jr., national president, in his opening address summarized the year's progress and spearheaded a group of speakers that included Secretary of Agriculture Charles F. Brannan; Hugh Hammond Bennett, Chief of the Soil Con-



Waters S. Davis, Jr.

servation Service; Dr. Jonathan Forman, vice president of Friends of the Land; and Donald McKnight, winner of the Dow Chemical Co. award for his speech, "What My Soil Conservation District Has Done for Me." (Parts of each of these addresses will be found elsewhere in this issue.)

Secretary Brannan and Chief Bennett, fresh from winding up conferences which led to the order coordinating Federal agency conservation activities on the local level, devoted their addresses largely to clarifying issues and dispelling doubts and challenging all comers to make the set-up work successfully. Each expressed heartfelt gratitude for the patience and helpfulness and unflin-

cooperation of Waters Davis, George Heidrich, and other district leaders. And both received enthusiastic ovations from crowded banquet halls.

For the first time since expansion of organization last year, the Association put on parade not only its national officers but also its seven hard-working area vice presidents: George R. Heidrich, W. F. Hall, Herbert B. Eagon, R. M. Boswell, Walter A. Groom, W. E. Silverwood, and Everett Barr.

The Association, centering its attention on its vibrant "program for greater service," shied away from a proposal for compulsory conservation.

Hosts to the delegates were the Oklahoma Asso-

ciation of Soil Conservation Districts, headed by President A. P. Atkins (see March SOIL CONSERVATION Magazine), the Oklahoma City Chamber of Commerce, and the Oklahoma Water Development Association.

Well planned, smooth running, expertly publicized, this convention not only was profitable and memorable to its participants but also served to unify the soil conservation districts as never before. It signalized the complete emergence on the national scene of a young, vigorous, and unique farm organization which from now on is sure to be heard from whenever the welfare of the American land is at stake.

WORKING TOGETHER FOR CONSERVATION

By the **HONORABLE CHARLES F. BRANNAN**
Secretary of Agriculture

(This address was delivered at the 1951 convention of the National Association of Soil Conservation Districts.)

I CONSIDER it an honor that you have invited me to have a part in this occasion.

At this moment, I feel about as I do when I am introduced to some handsome young fellow 6 feet tall, and his beaming mother tells me he is the baby of the family. Among farm organizations yours is something of a baby. In July of this year you will become officially 5 years old. Even if you date your age to the Washington meeting in January of 1946 when your founders instructed Mr. E. C. McArthur to explore the possibility of bringing the State organizations together in a national association you are only a month over 5 years old.

Seldom do 5 years bring so much growth, in numbers, in stability, and in clarity of purpose.

In these days the whole civilized world is wondering what course the future will take. If the things we hold dear are sustained, and if human freedom is to prevail—as we are determined it will—one of the important factors will be that the soil conservation movement came into being in the United States when it did and as it did.



The Honorable Charles F. Brannan.

If ever we needed to assure big crops for the future, that time is now. We have heard more about surpluses than about shortages in the last few years—at least I have. But very few of the world's people have the comfort of a surplus these days; and I am sure that in the long swing of history our ability to produce an agricultural abundance and keep on producing it will give us an advantage of tremendous importance.

For one thing, we are eating more food these days. Even with what appears to be a shortage of certain meats, the average person in the Nation is eating much more of those meats today than he was 10 years ago. The apparent shortages here and there are really the result of our better standard of living. There are individual cases in which hardship exists as a result of higher prices, but the prosperity of our agriculture reflects by and large a better standard of living throughout our economy.

During any war or period of preparation for defense, there appear shortages of some consumer goods which depend upon scarce metals or which require certain kinds of manufacturing plants that may have been converted to war work. And this means that, with fewer of those durable goods to buy, people spend relatively more money for food. I for one expect the American family of average means to bid for a better diet during the years ahead.

It is only prudent for us to maintain or build up our stocks of farm products so that they are available when we need them—our above-ground stocks. Whatever emergency situations may confront us, we shall be better prepared if we maintain our visible reserves at a high level, and keep up a large carry-over of storable basic commodities.

Then too, this country, with a spirit stemming from its great humanitarian tradition, has undertaken to send food to drought areas of the world, and to other areas where famine is threatening. This ability to send supplies overseas when they are needed takes on added importance today. By doing so we may be able to help keep important parts of the world from becoming attractive hunting grounds for the forces of aggression.

Important as they are, our above-ground supplies—our full warehouses—are only a part of what we need to store up. We must maintain in our soil the potential for abundant production which can continue for years if the need continues.

Moreover, our own population is growing. In 25 years it will not fall far below the 200 million mark, at present rates of increase.

This whole task, meeting our emergency responsibilities and maintaining our productive potential for the future, depends upon the same land, approximately $1\frac{3}{4}$ billion acres, that we now have.

If we are to be able to feed 175 to 200 million people a short 25 years from now, and be ready to take on part of the job of feeding more millions outside the United States, we must keep our farms productive; more than that, we must increase their productivity.

Our plant breeders can turn out better plants; our scientists can devise new protective chemicals. We can find better ways to feed livestock and poultry. Our machinery manufacturers can make faster and more efficient machinery to multiply the work of a man's hands. Each of these is an essential part of the great task, and each has contributed heavily to the abundance we now enjoy. But that is not the whole answer to our production problem. Far from it. The entire Nation and a large part of the rest of the world depend upon one thing which is in the farmers' care, and that is our land. In spite of publicity given to water-culture and other laboratory-scale practices which grow plants without earth, as far ahead as I can see, we shall have to count upon the land—and for us in the United States, essentially the same land we are now farming—to feed us and clothe us, to grow our wood, and provide farm raw materials for industry.

It is not enough to look back to what we think our soil may once have been and try to reestablish some past balance. When early settlers first came into most of the land that is now the United States, it was producing almost no surplus. Year in and year out the grass grew or the forests stood, harvested only by occasional fires, by the grazing of wild animals, or to a small extent by the Indians who lived here in relatively small numbers. There existed an almost unproductive balance.

In the modern world we cannot survive on that basis. We must, in order to survive, produce a surplus which can be harvested and hauled away and used great distances from the soil that produced it. The amount of that surplus must increase as the years go by.

We must recognize that we have taken the geology of large areas of the earth's surface into our own hands. Man is becoming and in many places has already become a more important geologic factor than the glaciers were.

And man's effect on the land will continue as long as there is an inhabited earth. If man is to survive and enjoy increasing abundance we must find and establish a new kind of balance, a dynamic balance of use and care. As it is today, we have learned much that is essential about how to use our soil wisely, but we have only begun to apply that knowledge. We know for sure that unwise land use can waste its productivity and bring on either a decline in production or the necessity for increasing efforts to maintain production.

We are learning how to care for our soil, and use it, so that we believe we will be able to make it better and better as the years go by—this is a fact of untold importance. It marks a new epoch. As I see it, we must apply our knowledge promptly and fully to underwrite a stable, strong civilization with a future of freedom. That is why I said to you, as I did a little bit ago, that the development of the soil conservation movement in this country when and as it developed, may have been of historic moment.

In the beginning of the Forest Service, the oldest of our conservation agencies, the United States first became aware of conservation as a national concern. The Forest Service has established a fine record which has in a sense been the example for younger conservation agencies.

Soil conservation as an organized movement is not very old; it is hard to say just when or how the idea began, but it is not hard to say who began it. It is an honor for me to be associated with Dr. Hugh Hammond Bennett, who will celebrate his seventieth birthday in just about 2 months. His boundless energy, his great devotion to this work, were without question the personal forces which gave the movement its great impetus in the United States.

In recent years, there have been several more or less concurrent legislative developments of our soil conservation activities. I have already mentioned the Forest Service. The major agencies concerned directly with soil conservation have been the Agricultural Conservation Program of the Production and Marketing Administration and the Soil Conservation Service.

Let us look at the Agricultural Conservation Program of the Production and Marketing Administration. It has always been a very elastic kind of program, as any such great undertaking must be. It was originally conceived in the 1930's. You will remember that, due to the Great Depression, the Nation was then not eating very well and not using as much farm production as it needed. Land was taken out of cultivation to bring supply back into some kind of balance with what the markets could use. The Agricultural Conservation Program had its inception as a way of keeping the land from eroding and being lost, as it was taken out of active use, and to do something better with it than let it grow up to weeds. The conservation payments helped cover the cost of certain recommended conservation practices the farmer was asked to adopt. It got results, and it helped a lot of farmers to avoid foreclosure of their mortgages. We may be grateful now for the strength of the agriculture which that movement helped to preserve and build.

Through the years this developing program has been studied at the national, State, and county levels, and adapted to the local areas by the PMA county committees. Perhaps some of you are members of, or have been members of, one of these committees. Certainly the committeemen are among your friends and neighbors.

By and large there is no more highly respected group of farm leaders across the country than the PMA county committeemen.

We hope that program can continue. To speak with complete frankness, the incentive of money paid has in many cases been just the incentive it took to get adopted the conservation practices the national interest required. There is no need to apologize for this kind of subsidy or the need for it. We offer certain heavy industries an assured market, and we offer them advantages such as rapid tax amortization, to get them to expand and produce as the Nation requires. We have long aided industry with tariffs. We subsidize postal service and airlines and shipping. We have not hesitated to do what was necessary in the public interest, and soil conservation is vital in the public interest.

Now let us look at the Soil Conservation Service. The way to look at this agency is from the standpoint of the districts because the most important work, and by far the greatest volume of work of

the Soil Conservation Service, depends upon the cooperation of the districts.

There is, I am afraid, confusion in the minds of some people about these soil conservation districts. Some people still think of a soil conservation district as some part of the Federal Government by which the Soil Conservation Service tells farmers how to farm. You, in this Association, know the facts better than that. You know that in every State of the Union and in the Territories, the legislatures have adopted their own laws authorizing the formation of soil conservation districts. Under the provisions of these laws, local people have organized soil conservation districts, have voted them into existence. There are now 2,330 of them, and they embrace about three-fourths of the Nation's agricultural land. These districts are planned, managed, and administered by the local people. You supervisors . . . some States call you commis-

sioners, or directors . . . are the elected representatives of those people.

The laws provide ways by which any soil conservation district can dissolve, and cease to exist, if the people it serves do not like what it means to them.

You might be interested to know that there have been, to my knowledge, only two cases in which soil conservation districts have disbanded. One of them became the site of a giant atomic energy plant; and in the case of the other, those farming most of the area promptly voted themselves into an adjacent district.

I have been emphasizing that word "*district.*" You are a kind of local free enterprise. Nobody can force membership, cooperation, or participation in a soil conservation district upon you. The Department of Agriculture does not set up districts and run them. Neither does the Department of Agriculture make districts successful. Only the

THE SOIL CONSERVATION DISTRICT
local self-government in SOIL CONSERVATION

Federal Government

- UNITED STATES DEPARTMENT OF AGRICULTURE
- SOIL CONSERVATION SERVICE
 - technical services and some materials and equipment
- OTHER USDA AGENCIES
- OTHER FEDERAL DEPARTMENTS

State and Local Government

STATE SOIL CONSERVATION COMMITTEE
guidance and aid in carrying on conservation work

EDUCATIONAL INSTITUTIONS

- Schools and colleges

Agricultural Extension Service

- Local Agricultural Departments

FORESTRY, FISH, WILDLIFE AND LANDS DEPARTMENTS

COUNTY, MUNICIPAL AND TOWNSHIP AGENCIES

OTHER STATE AND LOCAL AGENCIES

Private Agencies

- civic groups
- manufacturers and distributors
- transportation and communication agencies
- banks and bankers associations
- labor groups
- conservation groups
- educational institutions
- churches
- women's clubs
- boys and girls' clubs
- farmers and stockmen
- other interested citizens

SOIL CONSERVATION DISTRICT

PUBLIC LANDS

- highway erosion control
- protection of municipal water supplies
- erosion control on parks, institutional farms and other public owned land

FARMS AND RANCHES

- soil and water conservation and good land use on entire farms and ranches through cooperation with individual farmers and ranchers of neighborhood groups
- conservation on drainage, irrigation, flood control, reservoir protection and other operations where groups of farmers or ranchers must work together

OTHER PRIVATE LANDS

- erosion control, woodland conservation and other conservation work on land used mainly for lumbering and mining industry, or other non-agricultural purposes

This exhibit attracted much attention at the convention. It was prepared under the supervision of Herrin F. Culver, head of visual information, Soil Conservation Service.

people who live there and farm there can do that.

These two great soil conservation programs—the Agricultural Conservation Program of the Production and Marketing Administration, and the cooperative work of the soil conservation districts and the Soil Conservation Service—in the natural course of their work have brought their lines of activity closer and closer together. Where formerly the similarity of their work was more or less coincidental, their primary objectives are now essentially the same.

Thus, it has come as no surprise to many of you, I am sure, to hear the recent announcement calling for these two great programs to work together in the closest of cooperation and with a single line of purpose.

The Soil Conservation Service technicians in your districts are paid by the Federal Government and their activities are administered from the Department of Agriculture. Also, the Agricultural Conservation Program of PMA exists under Federal law, and the money is paid from the Federal Treasury. These two can be brought together by the Department of Agriculture. We have now required that they work together closely.

Henceforth, also, the Agricultural Conservation Program will be planned at the State and national levels with the direct assistance of the Soil Conservation Service and the United States Forest Service.

Soil conservation districts are a different matter. Your districts do not exist by Federal law but under State and Territorial law. The Federal Government can offer cooperation with you, but it cannot compel it.

The directives I have recently issued require that not only SCS technicians but also the PMA county committees extend every cooperation to your districts, and I hope you will take advantage of it to the fullest extent. Upon your doing so depends the success of our present efforts to bring these two great conservation activities together. As I said, the Federal Government cannot make a district successful but by these new orders the Department hopes to promote greater effectiveness both in the Agricultural Conservation Program and in the work of your districts.

In connection with the issuance of these administrative orders, we have put down in words something that most of you have been working on for years. Informally it has been one of the great

objectives of American agriculture for several years. Now it is the stated official policy of the United States Department of Agriculture. Let me read it to you, because I think the official wording is about right.

“The basic physical objective of soil conservation activities by the Department agencies shall be the use of each acre of agricultural land within its capabilities and the treatment of each acre of agricultural land in accordance with its needs for protection and improvement.”

That is a tremendous assignment. If there were no threat to world peace, if we could direct our entire energies toward making that kind of farming part of the American tradition, it would take decades. Yet the world situation today and the imperative requirement that we be able to keep on producing abundantly for a long time to come make it even more urgent that we get about this work.

Our conservation work up to now is a vital beginning. It shows us not only how to do the job but it heartens us in our belief that we can accomplish it.

I know that there is more to farming than improving the land. You also have to make a living.

You have the daily, the weekly, and the yearly routine of things that somebody has to do and most of the time that means you have to do them yourself.

Agriculture is headed into difficult times in this country. The forces of world aggression are responsible, but there is no way out. So, we will have to head into the work that lies before us and take things as they come.

The Nation needs agriculture strong, and we need the things farms can produce. The Department of Agriculture will do everything it can do to keep our farms strong and productive.

The abundance we need to have always carries the risk of price breaks. With price support statutes on the books we can protect against that risk. Maybe, with times as they are, support programs will be called upon only in a minor way. But having the programs available will do a lot to break production bottlenecks on the farm.

With those programs we can help direct farm production into the lines where the national interest most needs production.

The Department will also continue to do the many things it has been engaged in to help farmers

become increasingly efficient. In addition, the present emergency necessitates new lines of work, including efforts to keep supplies and equipment going to our farms as they are needed.

But important as these things are that the Government can do for agriculture, only farmers can farm. You, as farmers, are the people the Nation depends upon, and to a certain extent the whole free world depends upon. There are a lot of things you have to do for yourselves.

That is the way we Americans like it. We cherish our independence. Most farm people would rather not have done for them anything they can do for themselves. That is partly why the soil conservation districts have been so widely accepted.

That is why, also, our farm population is one of the world's great bulwarks of individual freedom. The world has its eyes on our family farmers. They are not collectivized, they are not oppressed peasants working for a handful of landlords. They are free citizens who operate their farms as they see fit. Their situation is the dream-come-true of millions of dispossessed people the world around. The United States is proud to have other countries learn about our family farmers.

In Asia today there are four people on the land for every one person who is at work in industry, or at war, or in some other pursuit. In the United States for every person on the farm there are more than five in the city. In the United States one person *working* on the farm can produce the necessary farm products for more than 14 persons not farming. While most of the world's people must stay on the land to live, our tremendously productive agriculture becomes a source of tremendous strength. You cannot measure the manpower of a nation today by simply counting men.

In the United States, as I have said, public interest requires that agriculture be kept strong and become more and more productive. It requires that the Nation through the Federal Government should in many ways help America's agriculture. Yet by their own productivity our farmers have become a minority. Through the use of modern methods they have made it possible for the majority of our people to work at other businesses and skills than farming, with the result that many of our people no longer understand the farmer's situation.

The city man who depends upon the farmer for

food and clothing should know a great deal about that farmer. He should think of that farmer when he makes his decisions as a citizen. He must have the living facts.

To that end, you have a thoroughly sound and workable approach in the "Suggested Program for Greater Service." I have studied it and I hope you will study it if you have not already done so.

You have actually got two jobs to do, if you want to look at it in that way. One we have talked about this evening; it is the job of assuring the future productivity of our land. It is a tremendous job, it is an essential job. Nothing else can take its place.

But the other is the job that is in our newspapers every day. The thing the United States is mobilizing for, the thing the United Nations are fighting for in Korea, the thing the United States means most of all, it is the right of people to govern themselves.

We in the United States not only think people should have that right, *but we think they can do the job*. We believe, we Americans, that people care enough about the importance of self-government that they will get together and work at it.

You in your soil conservation districts are in the front rank in this matter of self-government. The diligence, the leadership, the ability with which you conduct the affairs of your local districts is a field demonstration the world is watching and should be watching.

With the history of the world in the balance, we dare not weaken at any point. Our boys in Korea can hold the line there. Our representatives in the United Nations can make our influence felt in the field of world organization and cooperation. But only the people—the people who most of the time don't think much about their importance to the world—can show that we believe in and will live the life of disciplined self-government.

The success of the soil conservation districts in the United States is as important in the control of the world's spiritual erosion as it is in the control of the Nation's land use. I urge that you never underestimate the scope of that task.

"Soil and Water Conservation in the United States" has been issued in an English-French edition by the Soil Conservation Service. It includes halftones and two-color maps.



Co-workers in Washington smile their pleasure at news that Hugh Bennett will serve another year. Among the two hundred or more who dropped by to congratulate the Chief were—left to right, standing—Frank J. Hopkins, assistant chief of operations; Thomas B. Chambers, chief of engineering division; Grover F. Brown, chief of agronomy division; Frederic G. Renner, chief of range division; Homer M. Wells, chief of water conservation division; Edward H. Graham, chief of biology division; and Robert M. Ross, chief of nursery division.

THE CHIEF WILL STAY ANOTHER YEAR!

THE FIRST and only Chief the Soil Conservation Service has ever had will be with us for another year.

The good news came early in April, just about 2 weeks before Hugh Hammond Bennett celebrated his seventieth birthday. Under the law, civil servants are normally required to retire from active Government service when they reach the age of 70. But the long record of outstanding service by Dr. Bennett was recognized by Secretary Brannan and President Truman. By Executive Order 10229, they retained the Chief in his post for another year—until April 30, 1952—so that he would be able to

direct the Service through the crucial months of organizing soil conservation work for its maximum contribution to national mobilization.

Bennett was 70 on April 15. From the first of the year, newspapers, magazines, and farm leaders all over the United States had been urging that his vigorous leadership be kept at work, and not lost during these days of adjustment in conservation work and national stress.

In announcing the extension of Dr. Bennett's tenure in office, Secretary Charles F. Brannan said: "Particularly today, when agricultural production is so important in the mobilization program, Dr. Bennett's long experience is invaluable. His continued services will contribute greatly to the further advancement of soil and water conservation, which is so important in the mobilization of our agricultural resources."

Bennett's unique command of the national conservation scene was given fitting recognition at the recent annual convention of the National Association of Soil Conservation Districts. On this occasion he delivered the final major address and re-



We honor him for what he is, and for what he has done to make this country strong for defense, a good place to live, a land of prosperity and beauty and permanent productivity.

of the first National soil conservation program in the history of civilization.

We are grateful to Hugh Hammond Bennett for his insistence not only on sound science and correct techniques but also on truly grass-roots democracy. Because of his firm stand on these principles the American land today is a better land physically, with more woodland, more wildlife, higher crop yields, more stable soils, a multitude of farm ponds and clear streams. It is also a better land socially, economically and spiritually, with rural prosperity adding wealth to town and city,

with improved churches and schools, with finer bonds of fellowship among farm families as a result of working together in soil conservation districts and neighborhood groups.

First in the hearts of all who love the land, Hugh Hammond Bennett's conservation leadership has swept the nation and to a large extent the world. We bring to him today our pledge of continued devotion to the issues and ideals for which he has waged his long and heroic struggle to save the soils on which to build a bright Tomorrow.

In testimony whereof we have set our names here onto in convention assembled at Oklahoma City this twenty-second day of February, in the year of our Lord, 1951.

Walter S. Davis Chicago City, Ill. President	Clayton H. Hackhouse Wakarusa Ohio Vice President	Everett M. Bacon Liberty, Nebraska Area Vice President
Wm. Merrill Lincoln, La. Area V. President	Herbert B. Carr Bellevue, Neb. Area V. President	Wally A. Egan Grand Junction Colo. Area V. President
W. H. Hall Area VP Sparta, La.	George R. Hendrick Chiles, Tenn. W. Va. Area V. President	W. E. Schenck Redondo California Area V. President
W. J. Jones Gretna, Quebec Executive Secretary	W. B. Hoad Crested, N. Mex. Director	Don Anderson Hesperia, Cal. La. Director
Everett M. Gurr Liberty, Nebraska Director	Wm. Baird Lincoln, La. Director	Milton W. Branch Hawthorne, Idaho Director
Don J. Oman Fargo, N. D. Director	Wm. J. McGuire Crescent, Okla. Director	W. B. Egan Grand Junction Colo. Director
Daniel M. Nelson Kingfield, Conn. Director	Tom R. Powell Elkhart City, Ind. Director	Clayton H. Hackhouse Wakarusa O. Director
Augustus Finkbein Crested, Ky. Director	W. B. Egan Grand Junction Colo. Director	Bill Higgins Tennessee, Miss. Mo. Director

The National Association of Soil Conservation Districts
Executive Committee and Directors

SOIL CONSERVATION DISTRICTS AND THE REST OF US

By JONATHAN FORMAN

Jonathan Forman's convention address discussed the nutritional aspects of agricultural production. A distinguished practicing physician of Columbus, Ohio, editor of the Ohio State Medical Journal, member of the medical faculty of Ohio State University, Dr. Forman is also a vice president of Friends of the Land. In the latter capacity, he is in high demand as a speaker and radio commentator. Departing somewhat from his major theme, Dr. Forman in the excerpt which follows tells his listeners about the publications available to members of this great layman's organization.

FRIENDS of the Land publish two quarterlies, *The Land* and *The Land News*. *The Land* is one of America's most beautiful and inspiring magazines, expertly edited by Russell Lord, whom I hold as the best of the agricultural writers. *The Land* is filled with inspirational stories and poems, reports from distant lands, historical notes and essays on the essential features of conservation, as well as book reviews of an intelligent, mature type by the best writers in America. Most of the material is composed as works of love by some of America's best writers, and could not be obtained ordinarily at anywhere near the price that a magazine could afford to pay.

The Land News is a news magazine of the style of *Newsweek* and *Time*, which brings a report of what is going on in the field with special reference to soil and water conservation, restoration of soil fertility, and their relation to animal and human health.

The Friends of the Land Board of Judges for book selections consists of Louis Bromfield, the author-farmer-conservationist; Mrs. Luis John Francke, prominent in Garden Club circles and well informed on conservation; Paul Sears, head of the new conservation school at Yale and author of "Deserts on the March"; Russell Lord, well-known agricultural writer and editor of *The Land*; and myself.



Jonathan Forman.

Last year we selected that delightful book of Aldo Leopold, "Sand County Almanac" and J. Russell Smith's "Tree Crops." We now have one this spring that everyone should read . . . "Big Hugh," by Wellington Brink.

"Big Hugh" is the story of the life and work of Hugh H. Bennett, the Chief of the United States Soil Conservation Service. The problems of conservation have been appreciated by agricultural leaders for hundreds of years. Washington wrote about it . . . Jefferson laid out a plan for his own farm . . . but "conservation" had to wait until Hugh Bennett's staff could get around to doing the job! So, too, with the whole problem . . . it had

to wait upon Hugh Bennett. Brink's book tells not only the story of a great man, but it tells the story also of the United States Soil Conservation Service, and the work that it has accomplished . . . for up to now, the Soil Conservation Service is Hugh Bennett and Bennett is the Service.

We of Friends of the Land publish books which summarize what we ourselves have learned. First, there was "Soil, Food and Health," now out of print, which summarized what the 16 authorities on some phase of the subject had told us at each of our 8 annual institutes on conservation, nutrition, and health. Next was "Water and Man," which has been well received and will also soon be out of print.

At the moment I am working on the manuscript of a third book in this series, in which some 20 experts look upon the soil as a dynamic community. I hope to have it ready for the publisher soon.

In the meantime, Russell Lord has taken the best from some eight annual volumes of *The Land* and arranged this into an anthology entitled "Forever the Land." This volume, incidentally, tells the story of the beginning and growth of Friends of

the Land. This does not interfere in any way with the purpose to present the best that Friends of the Land have written since 1940. This book is published by Harper Brothers.

The attitude of us of the Friends of the Land is best illustrated by the poster which Ollie Fink has set up outside in the hall, on which our president, Edward J. Condon of Sears Roebuck, has said:

"There is no question but that in this country, the work of the soil conservation districts in their totality is the strongest, the most effective, the most productive single factor in the entire soil conservation movement. Friends of the Land from the beginning have endorsed, supported, and cooperated with this group whenever and wherever the opportunity presented itself."

Everyone who believes in the future of this Republic and who is anxious to defeat those who are intent upon giving us a planned economy and governmental controls through which we shall lose our freedoms and become serfs of those who govern, should get behind this organized, grass-roots movement of the farm people to bring health and prosperity to all of us.

STANLEY COUNTY WINS ITS STRUGGLE FOR WATER

**By the staff of the Agricultural Conservation Program, Production
and Marketing Administration, U. S. Department of Agriculture**

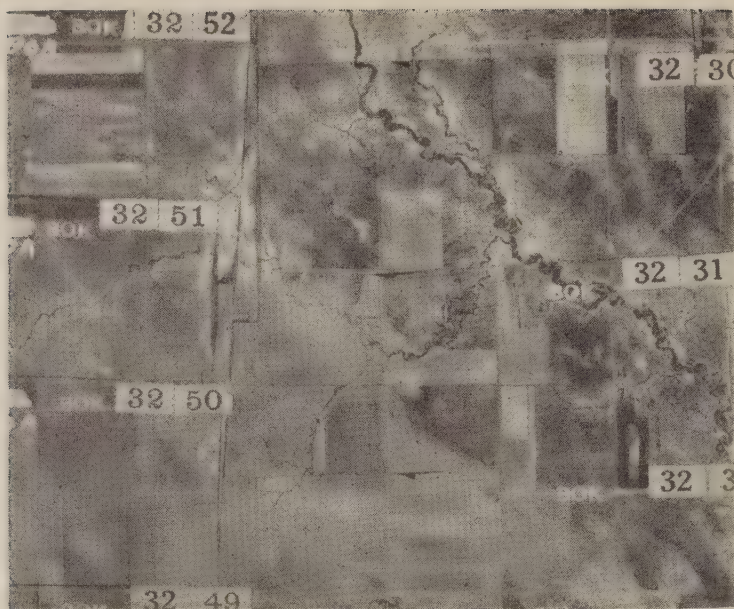
NOT ALL the drama of the range land is confined to the movie and television screen. Nor is all of its drama told in tales of conflict between cowboys and Indians, sheepmen and cattlemen, homesteaders and livestock men. One of the great all-time dramas of the plains is found in the struggle of the farmers and stockmen for water.

Let us consider a real western thriller. No papier-maché sets, no painted back drops are used. The vast and wind-swept prairie is the scenery. The cast is not made up of Broadway and Hollywood actors. The resourceful men and women of Stanley County, S. Dak., working under the sympathetic direction of their elected farmer county and community PMA committeemen, stage this mighty western drama.

THE SETTING: Stanley County is one of the many dry counties in the Great Plains. It holds this record despite the fact that the Cheyenne River makes up its northern boundary and the Missouri River flows down its eastern side. Although there are 125 miles of water along its border, only 16 inches of precipitation lands on top of it, and most of this is in the form of winter snows.

A great part of the little rainfall that Stanley County has received through the centuries has run off into the Missouri and the Cheyenne and other tributaries. The soil is black but only moderately fertile. The land surface in Stanley County was formed by the action of erosion and the land still erodes easily unless properly managed. When the

The farmers and stockmen of Stanley County, along with those of a score of other States, look to the clear skies and the unclouded sun day after day. It parches their land. It turns the soil that has been plowed to dust as fine as talcum powder.



Before.—Erosion conditions as seen from the air in 1938.

water runs off the unprotected land and fills the creeks and the streams and the rivers and finally gets to the Missouri, it takes with it a lot of the soil of Stanley County.

Properly managed, this soil produces a good stand of nourishing western wheatgrass, buffalo-grass, and other native grasses for livestock. There is, normally, moisture enough in the soil to produce grass for the livestock, but the limiting factor has been water—water for livestock to drink, and water for people to drink.

ACT I, Scene 1

TIME: 1933

Stanley County has 2,500 people, all but a few hundred of whom live on farms and ranches representing the largest population of the county as attained to this time. There are 350 operating ranch units—representing a peak number to date—scattered over the county's 960,000 acres. Only 50,000 of its acres are plowed up and planted to crops. Their livestock cycle is on the upswing and the county is approaching an all-time high of 34,000 animal units.

A common saying among the old-timers is that it is 10 miles to water—5 miles across and 5 miles down. The need for water remains of utmost concern. There are only 150 livestock watering facilities in the entire county. Because livestock do not move too far away from water, many acres of grassland are not being used. The depression is on, and Stanley County at the top of its development has tightened its belt. The people are determined to weather the depression.



After.—Same area in 1949, after farmers cooperating in Agricultural Conservation Program had carried out soil- and water-conserving measures.

The overgrazed land, too, turns to dust. Winds carry the soil into the skies. Then more sun and more wind. Their cattle are dying or becoming worthless from lack of range grass and water. They are shipped out and sold, and the 34,000 animal units have been cut in half—to 17,000 animal units. Windmills creak and groan above deserted farm-houses with their empty windows staring blankly over the dusty prairie.

The exodus of the farmers and stockmen is on. Of the 350 livestock operators, 250 are being forced to liquidate their holdings and look for new homes. The Government is buying up cattle and shipping the animals to States that have enough feed and water to keep them from dying of hunger and thirst. The great part of the land of the county is being taken over by county government to pay taxes. Business is paralyzed. There is only one livestock water facility to 6,000 acres. The 100 livestock operators who are sticking it out have some water some place on their range.

ACT II, Scene 1

TIME: 1937-38

An airplane flies back and forth over the county. It carries cameras and is photographing every acre



Aerial photograph of area in Stanley County, taken midsummer of 1938. One dam is shown in upper left-hand corner. Erosion is evident and fields show farming by compass instead of by contour.

of land. It is part of the work of the Agricultural Adjustment Administration, the predecessor of the Production and Marketing Administration. This agency in 1937 is beginning to set up a conservation program for the range area and is taking inventory of the facilities of the county. County and community committeemen are being elected to serve their neighbors in planning the Government conservation program and allocating the assistance made available to the ranchers by the Government for improvement of the range land, and, too, they are bringing out plans for hundreds of dams. Livestock watering facilities lead as the major project in Stanley County, but the committeemen are talking about stock plans of later programs, such as deferred grazing and seeding and reseeding of adapted varieties of grass and the planting of shelter belts. But these are to come. Right now the inventory still shows the 150 water holes and the vast area where the drought years caused the now short grass.

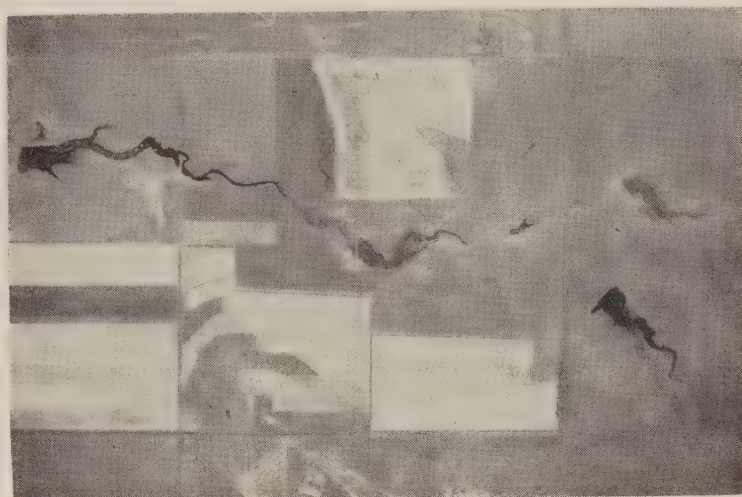
The regions from which the cattle have disappeared are still scraggy, poor, and almost worthless. Farmers and ranchers are taking hope as the number of water facilities increases month by month. The aerial photographer continues to take his pictures.

ACT II, Scene 2

TIME: 1949-50

The airplane again is in flight over Stanley County. The farm land is being photographed. The pictures reveal the progress made under the Agricultural Conservation Program. They show there are now almost 1,300 ponds. Some of them are almost small lakes. Instead of one pond to two

ranches there is now an average of five to each ranch. Instead of one water facility to 6,000 acres there is one for each unit of 800 acres. There is hardly a ranch that does not have some kind of water facility—most have more than one. One hundred and fifty new operating ranch units now dot the county, bringing the total to 250. Although this is less than the figure of the early 1930's, the livestock units on these ranches far outnumber the total number of the 1930 top figure. One hundred and twenty thousand acres of land which the coun-



Same area, taken midsummer of 1949. Note stockwater dams and contour farming. This indicates what has been going on all over the county.

ty government was forced to take over have been bought by ranchers.

Most of all, the fear of a drought year does not hang over the ranchers of Stanley County as it once did. Ernest Hedman, chairman of the county PMA committee, is asked if a dry year such as we had in the 1930's would cause the disasters of that time to be repeated. He replies: "No. Of course, a drought wouldn't be good. But there's hardly a rancher in the county who doesn't have a 2-year supply of water on his place right now, enough water to take at least his foundation animals through two drought years in a row. We're fixed for it now because we have water."

And there are lots of others who are benefiting. Youngsters who once had to travel for miles for water to drink can now fish in the ponds and small lakes stocked with fish. Ducks that once passed up this land in a hurry know a good thing when they see it, and now nest in Stanley County. The once-dry land is getting a reputation as a good hunting area and a fisherman's paradise. The tide of battle of the fight for water is turning to the side of these sturdy ranchers.

"WE WILL GET THE JOB DONE— ON TIME"

By HUGH BENNETT

(Excerpts from address delivered at the 1951 convention of the National Association of Soil Conservation Districts, Oklahoma City, Okla.)

RIGHT at this time, probably as much as at any other time since the first soil conservation district was established, there is much that we need to be thinking about, talking about—and doing something about—both as district officials and as assisting technicians. Again, and for the third time within the brief space of 33 years, we find ourselves in a state of emergency and national mobilization of our manpower and economic resources for defense of our country and of those democracies elsewhere we would have go with us and not against us. Again we find ourselves called on to defend soil and water conservation work against questions raised by the short-sighted, the misinformed, the meddlers. It seems to me rational people would never raise a question as to the perfectly obvious fact that in order to maintain national strength, we must safeguard and maintain the very source of our individual and national strength—our productive land. Some have argued that now, since we seem to be on the way to a long and destructive war, we can postpone soil conservation.

What some people still don't seem to realize is the fact that men with guns and bullets can't fight without food, and that there can be pitifully little food from poor land. No one knows how long the present emergency may last—1 year or 25 years. But the longer it does last, with the continuing need for maximum production of food, fiber, oil crops, timber, the more indispensable becomes our productive land from which all these necessities are derived. More important also becomes the conservation and efficient use of this land, and the water which makes it produce.

Among other things, in the light of conditions as they are, this would seem to indicate pretty definitely that government and local interests will need to assume an even larger share of responsibility

than ever for carrying on the vital conservation program. *Your soil conservation districts—every supervisor, every cooperator, and every potential cooperator—must redouble their efforts in safeguarding our productive land.* Every dollar of government money available for soil and water conservation—whether from Federal, State, or other sources—should be budgeted and spent so as to make sure of its utmost contribution to real conservation.

The Soil Conservation Service, for its part, will continue to use every dollar of its appropriations to the maximum extent possible in providing technical help to farmers in soil conservation districts as in the past. In fact, 88 percent of our entire personnel is thus engaged in soil conservation work on the land now. The Service likewise stands ready to give full cooperation and every encouragement to whatever program or agency is contributing to our common conservation objective, financially, educationally, or otherwise. We are not too greatly concerned over "reorganizations," which seem to lead some people off onto tangents of speculation and unwarranted forebodings.

It is you and your neighbors in the soil conservation districts, farm organizations, agricultural committees, and elsewhere who, I am confident, will continue to give the necessary direction and push to our over-all conservation undertaking. It is an important responsibility which you have in this matter, but one which I urge you not to avoid or slight in any way. Your help is always needed; now it is indispensable.

During the last year, about 10 new soil conservation districts were organized each month, along with substantial additions of new territory made to established districts. I hardly need to remind you what that means in terms of additional demands for technical assistance. Meanwhile, we had fewer technicians available, country-wide, to give service to the districts. What that condition adds up to is obvious: We have had to tighten up all along the line, and increase the efficiency of operations, individual by individual, and district

by district. We don't know what the situation will be next fiscal year precisely, but there is every logical reason to expect the manpower situation to get tighter rather than otherwise. That means again, of course, that all of us—district officials and Service personnel alike—have to take advantage of every good means of further increasing efficiency in operations.

Certainly, it seems to me, the National Association has moved in the right direction by adoption of your "Program for Greater Service." This is an action program, designed to give every district officer an important job to do, as well as enlisting the active support of everyone who may contribute in any way to progress of soil and water conservation through districts.

I am expecting much improvement all over the country through your "Program for Greater Service." Taken seriously, as everybody is expecting you to take it, there can be no doubt of its success. As I see it, success is dependent on you, but our people will help everywhere they can.

One of the best ways, also, we have found for speeding up the conservation job is for every farmer to learn as quickly as possible how to carry out as much of his conservation work himself as he possibly can, and how to keep up his structures and maintain his other conservation developments with a minimum of technical assistance. In that way—particularly now when the time of our limited number of experienced personnel is so fully occupied in furnishing technical assistance to the still-increasing number of soil conservation districts—each technician can be freed for that much more new planning and assistance in new land treatment.

Your reports indicate that the backlog of applications for district farm conservation planning assistance continues to be about 200,000. We are all glad, I know, to have a healthy work load ahead, instead of having to go about drumming up business. But you district supervisors and our technical people alike are anxious to get to every one of those farms with the least possible delay, as well as to the other farms and ranches constantly being added to that backlog of requests. That is why we are emphasizing the facilitating device of neighborhood action, maximum farmer application and maintenance work, and relieving the technicians just as much as possible from doing such "house-keeping chores," as routing and servicing.

And still more people—within your districts and the public generally—need to know the job there is still to do and what it takes in manpower and other facilities for getting that job done. They need to know, for one thing, that the continuing need for some years yet is for more technical and other manpower, machinery, materials, and so on, in order to pick up the lag and keep pace with farmers' demands. Fortunately, many interests, government and private, are giving increased attention, financial and other support to soil and water conservation, especially support to the district programs.

I hardly need to remind you, for instance, that State appropriations and allocations such as are now being made by all but three States, I believe, for assisting district programs are of substantial benefit in furthering soil conservation. There seems to be rather general agreement now as to the Government's obligation to help farmers with their erosion and land-use problems. How much help soil and water conservation receives from Government, and for how long, depends on the performance of those entrusted with this vital work—on individual landholders, district boards, technical personnel, and so on.

Among other points that must not be overlooked as important, unfinished business, we should all do what we can to:

1. Complete the national land inventory at the earliest date facilities will permit.
2. Complete the organization of the Nation's agricultural lands into soil conservation districts and strengthen district responsibility and work with a scientifically developed soil conservation plan for every farm in the country.
3. Urge active participation of all interested rural and urban groups—business, professional, and patriotic—in achieving Nation-wide conservation.
4. Make a real conservationist out of every farmer in the country.

We have a long way to go yet, you see, but with the task in such good hands as yours, we will get the job done, on time.

A documentary film, "Steel Fingers and Green Thumbs," is being released by Harry Ferguson, Inc. The 30-minute, color picture tells in graphic form the changes brought to American farms by modern machinery.

WHAT MY SOIL CONSERVATION DISTRICT HAS DONE FOR ME

By DONALD McKNIGHT

(Address which won the national \$500 award in competition financed by the Dow Chemical Co., delivered at 1951 convention of the National Association of Soil Conservation Districts.)

I AM Donald McKnight from Harford County, Md. I am speaking on the topic, "What My Soil Conservation District Has Done for Me."

"I wonder why we didn't think of that years ago," remarked a neighbor farmer the other day. We were talking about the ease with which we use huge farm machinery, such as combines, automatic balers, and corn pickers on our hills, and how the contour strips enabled us to pull heavy implements with medium-size tractors. Sure enough, why didn't we think of that years ago. Why, I remember when we first tried to plow with a tractor on my farm. We went around and around the large rectangular field. The tractor operator was almost constantly changing gears to suit the hills, and often the depth of the plow would have to be lessened so the tractor would have power and traction to pull it. It was uphill and downhill, overloaded and underloaded, causing needless waste of time and fuel, and wear and tear on the tractor. Today, I farm on the level, around the hill, on the contour. The tractor always has ample power to pull machinery at the proper depth or speed. It saves stopping to change gears, to say nothing of the savings in fuel and tractor maintenance. Why didn't we think of that years ago?

The answer to this question is obvious. We didn't have a soil conservation district in those days to tell us, and to guide us, yes, and to show us, all about these better methods. It is possible, yes, even probable, that we might still be working around the fields, up and down the slopes, fighting a losing battle against hills and gullies and sheet erosion, were it not for our soil conservation districts. They opened our eyes and helped us to rearrange our fields to be farmed on the level. That's what my soil conservation district has done for me.



Donald McKnight.

But this is of small importance compared to the real contribution of my soil conservation district. What a feeling of satisfaction it is to go to bed at night, hear the rain pounding down on the roof, and know that your farm isn't washing away. What a satisfaction it is to know that every furrow you plow, every row you cultivate, becomes a small dam or a terrace to stop or slow the flow of water from the field. The water no longer runs on my farm; it walks downhill. What a satisfaction it is to look over the fields after a hard rain and see the water still lying between the ridges of the contour corn rows, where once gullies, sheet erosion, carried countless tons of precious topsoil and valuable fertilizer and plant foods into the Chesapeake Bay.

That topsoil is forever gone. I can't reclaim it. It's somewhere down the river, perhaps helping to silt streams and ruin them for fishing and for sportsmen. Or perhaps it is helping to clog the channels of the Chesapeake, and is thereby costing us taxpayers millions of dollars a year for dredging.

During dry seasons, the crops on my farm don't seem to suffer like they used to. They have more moisture, because much of the rainfall soaked into the ground instead of running off. On my farm I have been able to all but eliminate the numerous gullies which were once a source of so much trouble and inconvenience. That has been done by alternating a contour strip of cultivated crop, such as corn, with a strip of hay. In this manner the runoff that does occur in the loose soil of the corn is brought to a stop by the next strip of sod before it can develop into gullies. What a difference this has made in the value of my farm and in the ease of farming it, thanks to my soil conservation district.

It was not so many years ago that there was never enough feed to carry the livestock through the winter. Each season corn and hay and sometimes barley had to be purchased. At the present time I have an abundance of hay on hand, a large amount of corn for sale, and I have already sold one-third of my total crop of barley, and I am feeding more cows than before. I would say that the livestock carrying capacity of my farm has about doubled since starting to cooperate with my soil conservation district.

Green pastures are the pride of any farmer. My permanent pastures are becoming greener under the soil conservation program. Only a few years ago, sufficient pasture was always a problem for a 30-cow herd during the dry, hot season of late July and August. Today, 40 head graze throughout the season with an abundance of lush, green pasture. In fact, it is sometimes a problem to keep the grass from getting ahead of the cows. This is the cheapest, most easily harvested crop I raise, and, I might add, is the most profitable. The first pasture improvement practice recommended and supervised by my soil conservation district was that of furrowing the sloping pasture fields. An improvement was soon noticeable. Runoff water was practically stopped. It soaked into the ground, making better pasture instead of bigger floods. During the dry season, the pastures are green instead of brown.

Another important phase of pasture improvement has been that of application of liberal amounts of lime, fertilizer, and manure; regular clipping to control weeds and excess growth; and rotation grazing: complete and inexpensive, yet a highly successful permanent pasture program.

My latest conservation practice has been that of wood-lot management. Selective marking and cutting of mature trees has been a welcome additional source of income. My wood lot is also a source of considerable pride, as tall straight young trees are showing promise of an indefinite supply of lumber for farm use and for sale. Although this work has been under the direction of my district forester, it has been encouraged by the soil conservation district, and had it not been for the splendid success of my soil conservation program, I probably would not have sought outside help in my forestry management.

One of the biggest things that my soil conservation district has done for me, and for my community for that matter, is that it has helped to make us soil conservation minded. This might be called the educational phase of their work. I no longer look at my topsoil as just plain dirt, but as life-giving, life-sustaining substance, which must be conserved if I am to prosper as a farmer, and if I am to leave anything worth farming to future generations. I have seen that my soil is not an inexhaustible storehouse, which can be farmed indefinitely without improvement. I have come to the realization that the soil is like a bank account. You can't keep checking out if you don't put something back, and bankrupt soil means bankrupt farming. So I farm with this in mind, using such approved practices as green-manure crops, winter cover crops, and recommended crop rotations. This, supplemented with plenty of lime and fertilizer, plus soil-holding conservation practices, means that my soil, instead of becoming exhausted, is steadily improving. My soil conservation district has educated me as to the real value of my topsoil. I find myself constantly planning my farm program with the thought of soil improvement. Every effort is being made to increase the humus or organic content of the soil through the careful use of crop residues, green-manure crops, and barnyard manure. The soil on my farm is thus becoming darker and richer, thanks again to my soil conservation district.

Many abandoned farms show the stark tragedy

of misuse of the land. Many farm families try to eke out an existence on poor, eroded, run-down farms. This results only in drudgery and poverty. Good conservation practices could have prevented it. I am not like the old farmer who boasted to his district supervisors that they couldn't tell him anything about farming, because he had done wore out three farms. I am continuously looking to my soil conservation district for additional advice, and for on-the-farm technical assistance with my soil problems so that my farm might never wear out.

But where my soil conservation district has been most appreciated is in the farm pocketbook. Since beginning to cooperate with my district, this farm has shown a steady increase, both in crop yields and in income. The past year of 1950 has seen the biggest yields in history come from my fields. Contour strips of oats and barley exceeded 60 bushels per acre, while field corn yielded nearly 100 bushels, an all-time high. Sugar corn yielded 5 tons per acre, another record. At a time when both civilian and military needs are high, this is important. A large mortgage has been paid off in recent years; new machinery has been purchased; all buildings have been painted, repaired, and improved; large amounts of lime and fertilizer have been applied; and modern conveniences have been installed in the farm home. My farm became completely debt-free a short time ago for the first time. This has been due, in part at least, to the increased production of the farm under the soil conservation program.

And I must not overlook the fact that my soil conservation district has helped to reduce floods and highway damage in this area through slowing and lessening the runoff water from cooperating farms. This means lower taxes are needed to pay for highway maintenance and to repair flood damage.

My soil conservation district has helped to make my community more prosperous, for conservation and prosperity go hand in hand. Increased yields for the farmer mean more food at a lower cost to the consumer. That means a higher standard of living and better health for all concerned. When Agriculture prospers, America prospers. It all adds up to more money in the bank, better buildings on the farm, and more modern machinery in the fields. It means fertilizer for the crops, orchids for the farm wife, and a brighter future for the kids. It means more of the nice things of life,

more of the little luxuries that take the drudgery out of farming and make farm life worth while. In short, it means better farming and better living.

Beyond a doubt, the soil conservation program has been the best investment ever made on my farm. That's what my soil conservation district has done for me.

DEMONSTRATING VALUE OF GROUP PLANNING

By KENNETH WELTON

AN EDUCATIONAL device used to sell the idea of neighbor-group planning, so successful in Indiana, may be useful to others who have the problem of converting the skeptical. I first employed this method in 1946 at the Turkey Run State conference of district supervisors. Approximately 150 district supervisors, 30 extension workers, and 30 district conservationists and farm planners were there. Following this demonstration the principle of group planning and action was accepted almost generally in Indiana, although not at once adopted. The use of the technique helped materially to put the idea across. At this one meeting all leaders were "sold" in less than an hour—no more time than it would have taken to teach the idea to each one individually.

The method has been found equally as effective in describing neighbor-group techniques as in describing unnatural-group planning. Since working with neighbor groups has become a generally accepted practice, we now start by demonstrating how the neighbor group and its leader are located.

The speaker has an assistant to keep tally. If a blackboard is used, so much the better. The speaker has a carton of cigarettes, or 10 objects of similar utility. The cigarette packages create some initial interest and, although not necessary in them—

Note.—The author is State conservationist, Soil Conservation Service, Lafayette, Ind.

selves as part of the demonstration, they are easy to obtain and are easily handled.

The speaker explains the problem of time wasted in individual planning. He indicates how much time could be saved by bringing all parties together for the first few meetings, and then doing the final planning with each farmer separately.

He demonstrates by setting up the 10 packages of cigarettes or other pawns before him on the table, distributing them in a scattered pattern. He then tells the audience that he is a farm planner and that the 10 objects represent farmers who have requested assistance from the district.

He explains that, on the average, each contact with a farmer on his farm accounts for half a day of a farm planner's time.

He asks his assistant to count the number of times his hand touches a pawn, because every such contact represents a visit to a farmer on his farm—or half a day of the planner's time.

The speaker then puts his hand on a pawn and describes how this farmer visited the district office and left his name with a request for help with drainage. The farm planner looks over his drainage situation but tells the farmer that drainage is only part of the problem. He tells him about a soil conservation survey and a farm conservation plan, but the farmer is interested only in drainage.

Another pawn is touched. Here is a farmer asking a district supervisor to have the planner call; he wants to put a terrace on a field so he can get ACP payments. The planner explains that a terrace system should be part of a conservation plan, that under some circumstances terraces alone might do more harm than good. He points out other soil conservation needs on the farm that are equally as important as terracing, again directing attention to the value of complete analysis and planning before action is undertaken.

And so, back and forth, the speaker touches one pawn and then another, always moving them towards a line at the extremity of his reach in front of him on the table. As he moves the pawns, he explains his contacts in simple terms and problems that the audience understands. Were he to continue, he would move each pawn five times and end with a certain number of pawns on the line ahead of him. These would represent the farmers who completed plans.

But it is not necessary to describe 50 farm visits or contacts, once the audience gets the idea of the

variety of situations met by the planner in his various calls. So he explains that he will save time by cutting out the description of his remaining calls, and moves the pawns to the planned position. He points out that it has taken an average of 5 visits per farmer to get them there. He has left 4 pawns short of the line, although he visited the farms they represent 5 times. These are farmers who would not complete a conservation farm plan. Then he asks his assistant how many days' work it took. The reply is that 50 farm visits were counted, an average of 5 per farmer. At $\frac{1}{2}$ day per visit, 25 days of the planner's time were consumed and since 6 plans were completed, it took 4 days per plan.

The speaker then instructs the assistant to count again. He returns the pawns to their previous scattered positions. This time he goes through the steps of locating a neighborhood and identifying its natural leader. He uses the pawns in describing his contacts. Then he describes how the leader calls the neighbors—7—to a meeting. In one motion, 7 pawns are swept together to represent the group meeting. He ignores the other 3 pawns.

He then covers briefly and systematically all the points that he had talked about previously while touching the 10 separate pawns. But this time he places his hand on the grouped pawns 4 times only. He then takes each pawn separately and places it on the finish line; this is the on-the-farm contact at which the plan is completed.

The speaker asks assistant for score. Assistant reports that there were 4 contacts in locating group and leader, there were the equivalent of 4 calls in checking over the conservation problems of the neighborhood, 4 contacts with the whole group at meetings (1 pre-planning and 3 planning) and 1 contact with each of the 7 in the final on-the-farm call, or a total of 19 calls. Nineteen calls at $\frac{1}{2}$ day apiece equaled $9\frac{1}{2}$ days of planner's time, which is less than half the time previously spent in getting 6 plans. This time he not only got 6, but 1 more, since there happened to be 7 in the neighborhood.

The speaker then points out how the planner's time and travel were saved, how he was able to do a better job by the group technique, how he used the neighborliness of the group and the leadership ability of a member to advantage, that the plans were of better quality than their predecessors, and that the farmers were more apt to apply them.

Finally he describes how the group may work together in application, with help of the conservation aid.

This technique is a combination of visual aid and showmanship. The combination of talk, moving pawns, and use of an assistant holds attention of the audience and puts over the idea. In this method, of course, we are not trying to demonstrate the technical problems met in farm planning but the general approach. For that reason the accounts of visits to farms are brief and suggestive rather than long and detailed.

REVIEWS

CONSERVATION EDUCATION IN AMERICAN SCHOOLS. Twenty-ninth Yearbook, American Association of School Administrators. 527 pp. Illustrated. 1951. 1201 Sixteenth St., N. W., Washington, D. C.: American Association of School Administrators. \$4.

This book was prepared mainly as a school administrator's guide for expanding and improving conservation education in the public schools of the United States. Although it places the main emphasis on what to do and how to do it, it also contains much excellent background material and points up the great need for more effective education on the conservation of natural resources. This volume should be valuable not only to school administrators, but should also be widely used by classroom teachers, supervisors, and all other people who are interested in conservation education in the schools of America.

The opening chapter is entitled "Conservation, the Price of Survival." It is a well-written and thought-provoking discussion. It should certainly awaken any of those teachers or school administrators who think that conservation is not a problem in which the schools should be concerned. Succeeding chapters bear the titles: (2) Initial Steps Toward Wise Resource Use, (3) Guides for School Programs in Conservation Education, (4) Instructional Materials and Facilities, (5) Some Good Practices in Rural Schools, (6) Some Good Practices in City Schools, (7) Promising State Programs of Conservation Education, (8) Regional Programs of Conservation Education, (9) Pre-service Education of Teachers, and (10) Administrative Leadership. This table of contents gives a very fair picture of the actual contents of the book.

Most of the discussions are pertinent and practical. Enough detail is given to enable the average school administrator or teacher to use the ideas presented; yet, the discussions are brief enough to prevent boredom.

A lengthy appendix gives: (1) selected references for teachers and for students at various grade levels, (2) audio visual materials from all sources, and (3) a list of both public and private agencies that may give a teacher aid in conservation education. These lists are probably more comprehensive and up-to-date than any other lists of this kind now in print. They, alone, should make the book the most valuable reference available to school administrators and teachers who are interested in conservation education.

—TOM DALE.

CONSERVING SOIL RESOURCES. A Guide to Better Living, compiled and edited by Paul W. Chapman, Frank W. Fitch, Jr., and Curry Lafayette Veatch. 355 pp. Illustrated. 1950. Atlanta, Ga.: Turner E. Smith & Co. \$3.28.

This book should prove a top-notch soil conservation guide for elementary teachers. The authors composed the Book Committee appointed by the Georgia State Soil Conservation Committee with instructions to compile a teaching aid, and they consulted a large coterie of State agencies in completing their task. The result of their efforts is an attractive book organized primarily on a problem basis.

The introductory unit, "Land and People," notes our dependence on the soil and is distinctive in listing the human resources upon which conservation depends. The critical reader may question, however, the finality with which the fall of ancient civilizations is attributed to soil erosion, both here and in the closing unit of the book. The second unit, "What is Soil," is an effective presentation of facts, both by text and illustration. Unit III on "Soil and Water Problems" presents in adequate fashion the water cycle, losses from and effects of erosion. There are brief notes on conservation as a common problem and the need to "know your watershed." Subsequent units discuss in straightforward style the results of erosion research, soil conservation practices, and the manner in which the country is organized to undertake soil conservation work.

Unit VI covers the saving and enriching of farm lands by proper land use, maintaining cover, and proper cropland management. It closes with the note that conservation has created several new occupations although it lists only the farm-power contractor. Because there is a good unit on "Land and Wildlife," one wonders why woodland management, so important in Georgia and adjacent States, did not receive comparable treatment. Neither is there a unit on pasture land, although the subject is fairly well covered under other head-

ings. There is a unit on non-farm lands, such as roads, school, church, and home grounds. Another unit makes the point that conservation farming pays, entirely, however, in terms of economic values. The final unit is on the responsibilities of land stewardship.

There is a glossary, although it is interesting to note that the words "soil" and "land," used throughout the book, are not listed. I should think most teachers would want to differentiate them. There is a list of references, by units, which follows the glossary, and there is an index.

All in all, the book should prove very useful to teachers who wish to get a working background of soil conservation. The "Summaries" and lists of "Things to Do" which conclude each unit should be especially helpful. The book is put up in workmanlike style, presents its material effectively, and is well illustrated by drawings, tables, halftones, and, at the head of most units, full-page color photographs. Unfortunately, its usefulness will be largely restricted to the Southeast, or at least the humid sections of the country, for there are no examples from the Plains States, arid areas, or Far West.

—EDWARD H. GRAHAM.

NOTES FROM THE DISTRICTS

LUCKY 13.—He was lucky to be the thirteenth cooperator in the Lamoille (Vt.) Soil Conservation District, back in 1945, says Charley Grandey, who farms near Wolcott. He swapped 100 acres of "rough, bushy, run-out pasture land for seven cows" shortly after buying his farm, and then applied to the new district for technical help. That first winter he had to buy hay. He increased the size of his herd, and still found it necessary to buy a little hay each year until 1950-51, when he produced all he needed. All this and many other benefits have come to Grandey from farming under a complete conservation plan. He has established practices under this plan every year since 1946.

EXCELLENT SPECIAL ISSUE.—In March the *Delta Democrat-Times*, Greenville, Miss., published a 32-page, 4-section issue entirely devoted to agriculture—a super-size, standard 8-column newspaper abundantly illustrated with halftone and line cuts which gave a complete picture of land conditions and land use in Washington, Bolivar, and Sunflower Counties.

This notable issue is in the nature of a comprehensive yearbook of great practical reference value to the people of the three counties. It contains special articles by representatives of all local, State, and Federal agencies engaged in agricultural activities. Local business firms helped to make the

issue possible by advertising, which in itself was highly informative and stimulating. A wide range of up-to-date information by specialists and leaders in farm and civic affairs was included. This undoubtedly was one of the most ambitious and effective editorial undertakings of the sort ever attempted in the United States. The three soil conservation districts—Washington, Bolivar, and Sunflower—closely cooperated in the project.



TREE STUDY.—A 361-acre woodland near El Dorado, Ark., is serving as a conservation model for farmers, students, civic clubs, and the public in general. Owner of the tract, the Lion Oil Co., entered into an agreement last December with the Union County Soil Conservation District for development of a conservation plan covering the land.

The tract was once used for oil storage tanks which were made unnecessary by the development of pipe lines. Under the district agreement, each of five compartments will be cut selectively once every 5 years. Pine seedlings were planted in all areas not already forested. Precautions were taken against fire and grazing.

Main object is the perpetual production of the greatest possible amount of high-quality wood products. The plan included the three essentials of a conservation-managed woodland: protection, reforestation, and selective cutting.

The El Dorado Chamber of Commerce agreed to develop a continuing schedule of tours to take full advantage of the opportunities offered by the "living textbook." Foresters of the Southern Pulpwood Conservation Association and the Arkansas Resources and Development Commission and Soil Conservation Service technicians act as guides.

Three 1/2-acre permanent plots have been set up to show the growth of timber under different management practices. One plot is to be cut selectively. On another plot all trees larger than 8 inches in diameter will be cut—a typically wasteful practice. The third plot serves as a check, with no trees to be cut. Growth records are being maintained for all the plots.

—W. W. FERGUSON.

AUCTION INTERLUDE.—When the Walterboro and Bamberg Railroad went out of business 16 years ago, J. T. Herndon, assistant station agent at Ehrhardt, S. C., had to find another occupation. So he began holding cattle sales in his back yard.

Livestock development began to expand in his section about that time, and Herndon expanded with it. He now operates two livestock sales barns, one at Ehrhardt and a smaller one at Fairfax, S. C. Some 20,000 head of cattle and 80,000 hogs are sold at auction every year through the Ehrhardt barn.

Today Herndon is one of the biggest boosters of sound soil and water conservation in the South Carolina low country. That is because he has seen the effects of conservation farming on the quality of cattle sold at his livestock barns.

In 1943 he began to notice that some of the best animals at his sales came from farms of cooperators in the local Edisto Soil Conservation District and it gave him an idea. He got with H. K. Brabham, then district supervisor from Bamberg County, to see what they could do to encourage more farmers to develop the kind of program that was producing the top-grade cattle and hogs.

Herndon had a number of wooden signs painted urging farmers to develop improved pastures, plant sericea and kudzu, and terrace their land as recommended by the district. The signs were hung in the sales ring and on three trucks he operates. Later he obtained through the SCS regional office at Spartanburg pictures contrasting poor cattle on poor pastures with sleek, fat cattle on good pastures. Enlarged copies of the two pictures now hang in the sales ring. They are captioned: "Some of the Best Animals That Go Through These Sales Are from Pastures Developed According to Recommendations of the Soil Conservation Service."

With 200 or more farmers attending the weekly sales at Ehrhardt, Herndon and Moulton A. Phifer, work unit conservationist in Bamberg County, decided that there was a good opportunity during the auction sales to get across soil conservation information in more detail.

So about midway of the sales held every Monday afternoon, Herndon and Work Unit Conservationist Phifer discuss current soil conservation topics. The 15-minute discussion usually takes the form of an interview, with Herndon asking questions and Phifer giving answers.

Although emphasis is placed on developing and maintaining good pastures and the kind of grasses and legumes that can be grown successfully in the district, Phifer also stresses the importance of using and treating all the land in accordance with its capabilities, the class of land best suited to such perennials as kudzu and sericea, the value of the various plants for controlling wind and water erosion, and the importance of pastures and perennial forage crops in a complete farm soil and

water conservation program. He cites examples of farmers cooperating with the district who are carrying out successful livestock programs.

The 200 or more farmers who generally attend the weekly auction sales come from Bamberg, Allendale, Hampton, Barnwell, Jasper, Colleton, Orangeburg, and other counties in that area, J. A. Jordan, district conservationist, reports, and the result of the information presented during the sales is having its effect throughout the entire area.

"Application of soil and water conservation practices has been stepped up in that particular section and we have been able to work with some farmers for the first time since these contacts have been made at the livestock sales," Jordan says. "In the vicinity of Ehrhardt, more and more pastures are being developed and the good results obtained are encouraging other farmers to carry out similar programs."

Auctioneer Ray Rentz, who owns a farm in that section, is himself carrying out a good soil and water conservation program, according to Jordan. He is developing 125 acres of improved pasture, has 150 acres planted to blue lupine, is planting trees, is developing a wildlife area, and is planting close-growing crops in a hog-production program.



AG STUDENTS GET FARM.—At Newport, Maine, the school committee has turned over 10 acres—7 cropland and 3 woodland—to the Newport school's vo-ag department for use of its students in studying and applying conservation farming practices. Roland Mayberry, vo-ag instructor, will have assistance of SCS technicians working with the Penobscot County Soil Conservation District in classroom and field work. For cropland, the complete conservation plan includes contour strips, rotations, clearing, drainage, and multiflora-rose fences, and a fertilizer, lime, and improvement-payments program in which PMA will cooperate. For the second-growth woodland there is a protection, improvement, and management schedule. Establishment started this spring. Over a period of years, once the system is established, Mr. Mayberry says, the operations will pay the way and bring a good profit. The biggest return, he emphasizes, will come from values that future farmers get in learning how to protect their land and use every acre to its maximum capabilities without destroying its value. Present-day farmers in the community also will benefit, Snyder Von Day, SCS technician, points out, because the operations will be a demonstration of things that they can do to protect and improve their farms.



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SECRETARY OF AGRICULTURE

HUGH H. BENNETT

CHIEF, SOIL CONSERVATION SERVICE

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WASHINGTON, D. C.

☆ THIS MONTH ☆

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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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RESPONSIVE FIELD.—In 1947 Joe and Fred Tuttle, in the White River Soil Conservation District, obtained a complete conservation plan for their hill farm, near Tunbridge, Vt. They went to work at once on a 14-acre field, within a stone's throw of their barn, and started to convert it to hay land. The field was moist to wet, was full of large stones, stumps, hummocks, and holes, and in some areas there was considerable poplar, spruce, and hemlock pulpwood. It was poor pasture.

From sale of pulpwood they received \$350. When the clearing was completed in 1948, a section of brook running through the field
(Continued on page 278)



FRONT COVER.—W. R. Wilson supplied this aerial photograph of conservation farms in the Winneshiek County (Iowa) Soil Conservation District. In this area there are about 120 connecting farm plans, with only about a dozen farms short of making it a solid block. Nearly 100 of these farms belong to the congregation of this church. Parish property nearby is operated by the pastor and his sons. The Reverend Oscar E. Engbretson is one of the spearheads of the conservation drive in Iowa.

GRASSLAND FARMING IN ARKANSAS

By EDGAR A. HODSON

AFTER fighting grass for generations, Arkansas farmers are now growing it. They have found that grass is the most efficient erosion-control and water-conserving tool they can use. They also have found that grass is a profitable cash crop when the grower has good livestock to harvest it.

When a farmer in the upland sections of the State puts all of his land to the use for which it is best adapted, he is doing grassland farming. Good land use and grassland farming must go together to get the greatest returns, to build up productivity, and to control erosion.

Grassland farming must be planned to fit the land and the needs of the farmer. Adapted grasses and legumes will grow on a wide variety of soil types and in combinations to produce year-round forage. A year-round forage program means feed at minimum cost and a guarantee of greater net profits to the farmer.

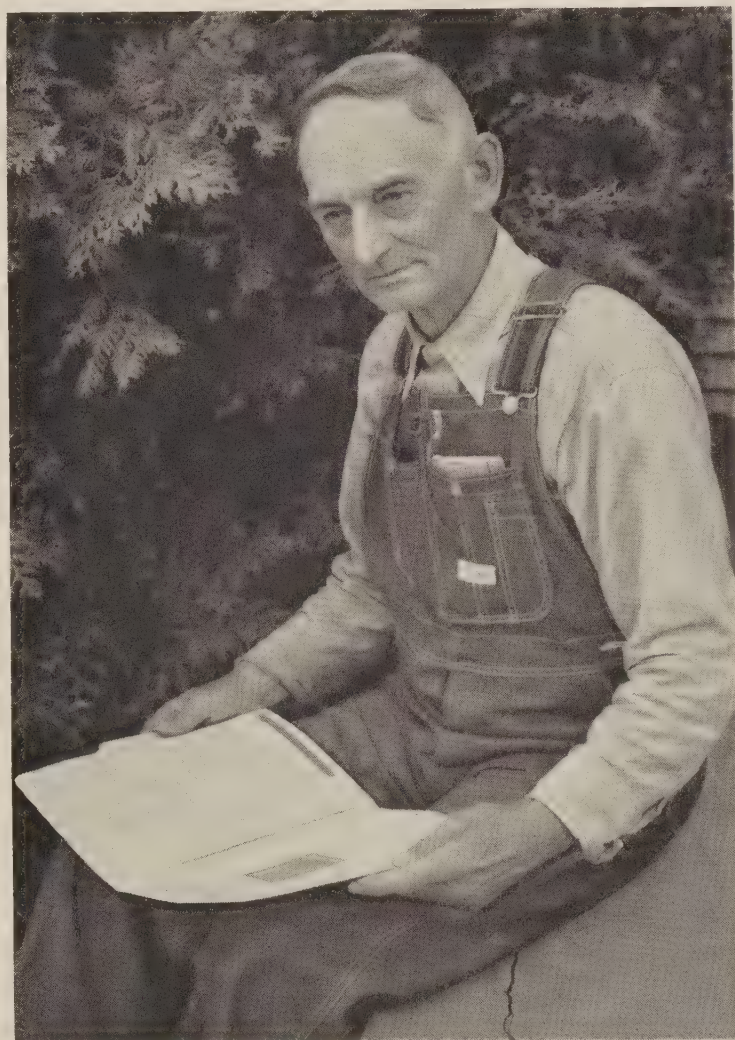
The year-round forage program includes separate permanent pastures for summer and winter grazing, plus separate crops for supplementary seasonal grazing and a reserve supply of hay or silage.

A visit to the farm of Alfred Austin, in the Benton County Soil Conservation District, is sufficient to convince anyone that a balanced pasture program with good livestock will pay good dividends.

Austin stopped growing row crops 15 years ago to produce only pasture and forage crops. He built up a high-producing dairy herd and a flock of 100 Hampshire ewes. The sheep have been able to get all of their roughage from pasture. The dairy cattle were fed hay only during the period from the middle of December until about the first of March. Austin is a pioneer grassland farmer. He has found that growing grass is profitable.

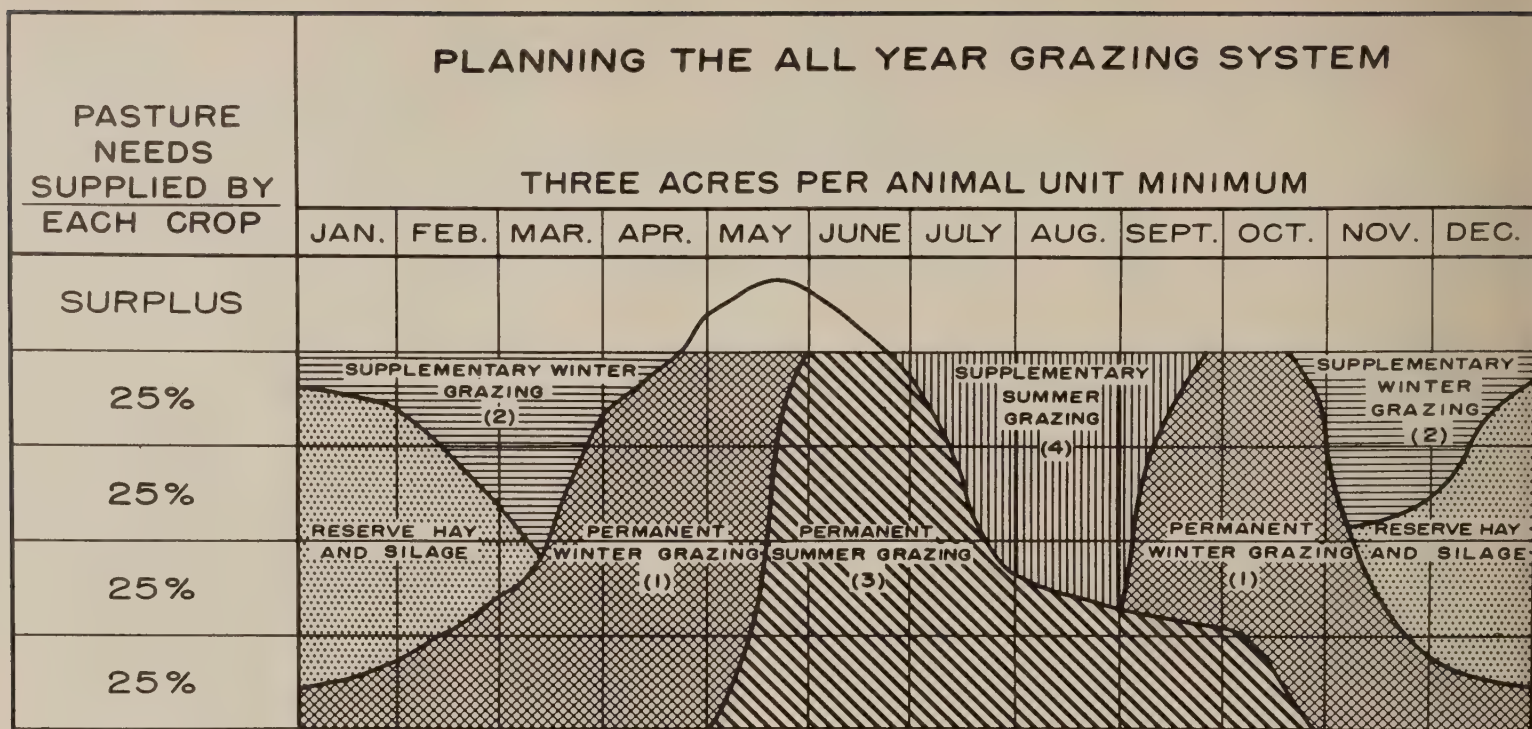
The all-year pasture program on the farm of the Arkansas State College at Jonesboro, in the Central Crowley Ridge Soil Conservation District, is an-

other good illustration of proper land use. Part of the permanent summer pasture is Bermuda-grass and lespedeza. Another part is Dallisgrass with white clover. The Bermuda-grass pasture is on land where erosion is a problem. The Dallisgrass is on the more fertile land and is better supplied with moisture. For supplementary summer pasture, sweet Sudangrass is planted on the good cropland. For drought insurance another summer supplement is provided by sericea lespedeza which will also furnish a crop of hay in the early summer. To extend the drought insurance further into the fall, kudzu is being added.



Alfred Austin is a pioneer grassland farmer who has found that good pasture is the most profitable crop he can grow.

Note.—The author is agronomist, Soil Conservation Service, Little Rock, Ark.



Typical plan for Arkansas dairy farmer. It should be noted that no 2 years will supply the same volume of seasonal grazing. A reserve supply of hay and silage should be included to insure against severe winter weather. The acreage required for each crop will vary with the productivity of the soil. The grazing plan for beef cattle would require variations from this plan to fit the needs; for example, less supplementary pasture would be necessary. Suggested crops: (1) Fescue or orchardgrass with white or Ladino clover; (2) ryegrass or small grains with winter annual legumes; (3) Bermuda-grass and annual lespedeza or Dallisgrass and white clover; (4) sweet Sudan, sericea lespedeza or kudzu.

The sericea is on land not suited for clean-tilled crops, and the kudzu will be planted on land rough and badly gullied. Fescue with Ladino clover has been established for permanent pasture for winter and cool-season grazing. It may be grazed when the ground is wet. It is planted on the more fertile land and where drainage is a problem. Supplementary cool-season grazing is produced on the good

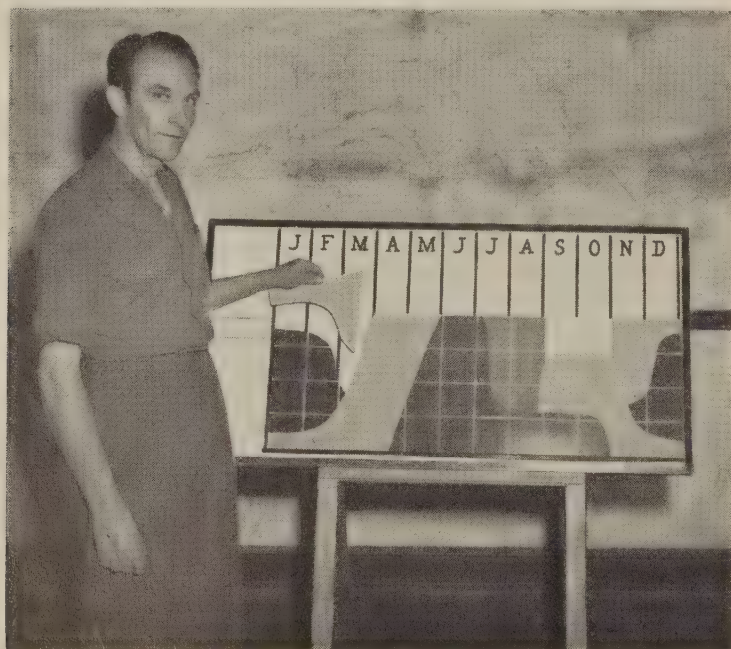
cropland from oats or ryegrass with crimson clover to be used when the ground is dry.

The hay that is needed comes mainly from surplus pasture. It is planned later on to use the surplus pasture for silage instead of growing sorghum for silage, as at present.

The plan calls for an adapted pasture or forage crop on every acre of the farm.

The all-year grazing program is gaining momentum. Good examples of progress may be seen in all soil conservation districts in the hill sections of the State. In the Poteau River (Scott County) and Rich Mountain (Polk County) Soil Conservation Districts many farmers are growing grass as their most profitable crop. The cooperators in the Rich Mountain Soil Conservation District expect to plant more than 40,000 pounds of sericea lespedeza seed in 1951. The acreage being seeded to Dallisgrass and fescue is also being greatly expanded.

At Morrilton, in the Central Valleys Soil Conservation District, the chamber of commerce, along with other local organizations and agricultural agencies, is helping farmers to develop sound pasture programs. The chamber is making loans to farmers to purchase seed and fertilizer. Albert Steffens, co-owner of a cheese plant at Morrilton, bought a farm and is establishing an all-year pas-



Jim Irving showing group how the all-year grazing program works out. He uses a jigsaw chart to illustrate the period of use for each pasture crop in the plan.

ture program to show other farmers what can be done. From milk-delivery records he can show his customers how well a sound pasture program pays off.

Summer pasture only: Bill Bridgeman has a herd of 40 milk cows. He milked an average of 22 cows throughout 1950. He has 300 acres of fairly good pasture, Bermuda-grass and lespedeza. His cows produced a total of 55,629 pounds of milk last year, an average of 152 pounds per day from 22 cows or 7 pounds per cow per day.

Summer pasture plus supplementary winter pasture: Frank Rohlman planted oats in the fall of 1949 for winter grazing. His summer pasture was mainly Bermuda-grass with lespedeza. In the fall of 1950 he planted crimson clover with oats and ryegrass. Rohlman milked an average of 12 cows for the year. His total milk production was 56,651 pounds, an average of 155 pounds per day or 13 pounds per cow per day.

All-year pasture: Albert Steffens with a complete pasture program with permanent winter and summer pastures, plus supplementary seasonal pastures, produced 94,542 pounds of milk, an average of 17 pounds per cow per day.

Ernest Trafford sold \$73 worth of milk in December of 1949. His feed bill was \$50. In the fall of 1950 he planted 6 acres of crimson clover to oats, and 6 acres to fescue and white clover. The same five cows produced \$104 worth of milk in December of 1950. The feed bill was \$12. A saving of \$38 on feed and an increase of \$31 for milk—a net gain of \$69 for 1 month!

When a farmer develops a coordinated conservation plan on his farm, he puts each acre to the use for which it is best fitted. He supplies to each field the conservation treatment needed to control erosion and to give him profitable, continuous production. When that has been done in areas where erosion has been troublesome the result is a grassland farmer.

TRAILING RASPBERRY—ANOTHER OF THOSE VERSATILE PLANTS

By FRED P. ESHBAUGH

“TRAILING raspberries? I like them very much. They do a variety of things, from keeping woodchucks out of the garden to controlling erosion and providing lots of fruit for the family.”

Thus, Adolph Habrich, who lives near Pawnee City, Nebr., in the Turkey Creek Soil Conservation District, describes this plant which is relatively new in the United States but is showing promise for erosion control on tough sites in certain areas.

And the site for the Habrich planting of trailing raspberries was tough—a barren east bank of a natural drainage below his farm pond, with soil known locally as “buckshot gumbo,” in full sun most of the day and exposed to intense afternoon heat in summer.

The 100 plants he got from the Soil Conservation Service in the spring of 1938 seemed so puny,

Habrich relates, that he didn't have the heart to put them out on their own. Instead, he put them in his garden where in a single season they doubled in number by producing new plants at the tips. The following spring he planted them on that barren bank.

Today the plants cover a quarter of an acre and would have spread more if it hadn't been necessary to control them to prevent their encroaching on the garden space. The fruit they produce, Habrich reports, is so good that it is a “special occasion” dish with his family.

Habrich's experience, and the experience of others, gives some idea of the usefulness of trailing raspberries. Apparently they are cosmopolitan so far as soils and site locations are concerned, but have not proved adapted, in Nebraska and Kansas at least, in areas where there is less than 24 inches of annual precipitation. They have grown well on poor Dakota sandstone soils in Lancaster and Saunders Counties, Nebr., and on deep loess soils in Brown County, Kans.

Note.—The author is nursery manager, Soil Conservation Service, Manhattan, Kans.

At the Soil Conservation Service nursery at Manhattan, Kans., the trailing raspberries have grown vigorously in deep sandy soils, and in a gully planting of note—on the Dubach Brothers farm near Blair, Kans., cooperating with the Doniphan Soil Conservation District—the raspberries are rooted in deep Knox loess.

This land is steeply rolling and subject to severe erosion but is considered one of the better orchard soils in Kansas. One hundred trailing raspberry plants were set out in 1942 in an active gully on the Dubach farm along with several hundred black locust and catalpa seedlings.

No attention was given to this planting, but the plants thrived and spread in nearly full shade beneath the locust and catalpa trees. They also have crept out into the open along the gully banks and are moving up the gully.

Although the gully is still active above where the planting was made, it has been checked effectively in the planted area.

"The development of this planting is surprising," according to Wilber Copenhafer of the Soil Conservation Service at Troy, Kans. "It shows that sometimes a little patience is needed. At first there wasn't much evidence of the raspberries, but they came through in good style."

One of the wildlife-area plantings was made in 1942 by J. C. McGill, a cooperator with the Lancaster Soil Conservation District, at his farm near Waverly, Nebr. Two hundred trailing raspberry plants were set as an outside border on the south and west of a wildlife area that is fenced out of a brome-grass pasture. This is also a tough site, since the farm has a Dakota sandstone outcrop, and the fenced area has a mixture of hardwoods, shrubs, and conifers.

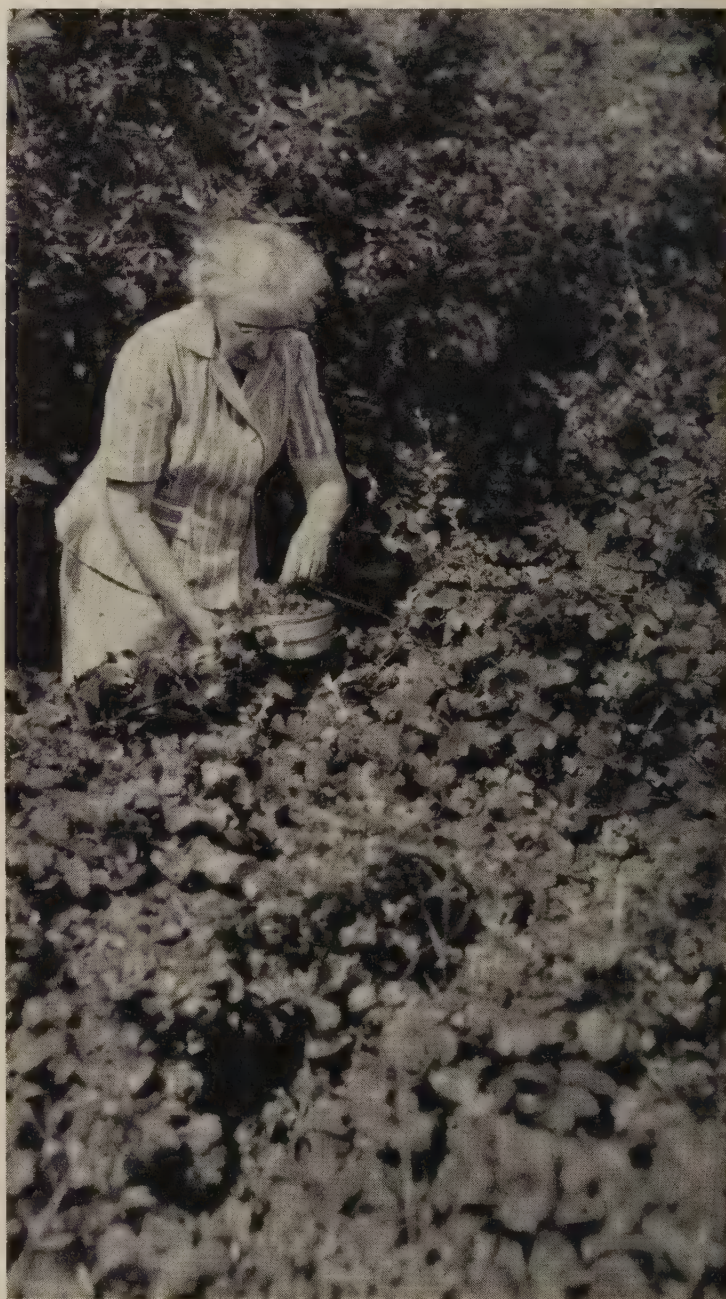
The trailing raspberry plants have spread into a belt about 30 feet wide around the wildlife area and are moving inside it among hackberry, buffaloberry, sandcherry, buckthorn, ash, mulberry, and cedar. Nor have the raspberry plants shown any inclination to retreat before brome grass.

Here, too, the fruit produced by the trailing raspberries is popular in the neighborhood. Mrs. McGill said that if the family should move, some trailing raspberry plants would be taken along.

A native of Japan, trailing raspberry was first introduced into the United States in 1929 by P. H. Dorsett and J. W. Morse, explorers of the division of plant exploration and introduction of the Bu-

reau of Plant Industry. It is a true trailing red raspberry, correctly identified as *Rubus parvifolius*, or crimson-flowered trailing raspberry. The fruit is attractive in color, size, and flavor. There is little or no bloom on the fruit, which closely resembles that of a dewberry (trailing blackberry) in the darker-fruited strains.

Soon after its introduction in testing stations in Maryland and North Carolina, plants were distributed to nurseries in many localities for observation and testing. It was hoped by recipients of the early allocations that they had at last been freed of the worry and care of producing an acceptable raspberry for general use outside the recognized



Mrs. J. C. McGill picking some of the fruit on the McGill farm in the Lancaster County Soil Conservation District. Two hundred plants obtained through the Soil Conservation Service were planted as an outside border on the south and west sides of a wildlife area in 1942.



Propagation of trailing raspberry plants is carried on at the Soil Conservation Service nursery at Manhattan, Kans. Plants obtained from Willard, N. C., have been used as foundation stock. Here is seen part of the half-acre block at the nursery.

commercial berry-growing districts.

There were several qualities on which to base these hopes. The plant is hardy, shade- and sun-tolerant, vigorous, free from disease, and it will grow in a wide range of soils and under variable rainfall and temperature conditions. It roots from the tips of canes. Under undisturbed field conditions, it spreads rapidly and forms a dense cover for protection of soil and wildlife.

Two employees of the Soil Conservation Service, L. E. Smedley at Pawnee City and D. E. Hutchinson of Lincoln, pioneered in planting trailing raspberry for soil conservation in this region. Miss Eva M. McMillen, home economist at Kansas State College, conducted tests on the quality of the fruit. She made pie, tarts, jam, jelly, and juice and also served fresh fruit. These all got a high rating from a testing committee in the home-economics department.

Experiences with trailing raspberry supply no indication that it can equal grasses and kudzu as a soil cover, but it certainly has special uses in localities where it is adapted. Nor are large plantings needed to supply fruit for a family. A small area of wasteland, a gully in a pasture, a nook near the farmstead, part of the area around a fenced pond, a border along a windbreak, will do.

Spacing of plants can be varied to fit the planter's equipment, especially if the planting is to be cultivated for a year or more. In general, a 6-by-6-

foot spacing of the plants will produce a good cover in 2 or 3 years. But an even wider spacing may be used, since the canes, which may be somewhat branched, often extend 6 to 8 feet from the crown.

Some observers have reported poor fruit production from trailing raspberry plants. This may be due to a combination of factors, such as heredity, late freezes, poor pollination conditions, dry weather, or low plant vigor. To avoid hereditary causes, it is best to use only plants grown from the seed from proved sources. Plants from Willard, N. C., were used for the foundation stock at the Soil Conservation Service nursery at Manhattan, Kans., from which have come the plants distributed to soil conservation districts in the Northern Great Plains. No shy bearing due to heredity has been experienced with them.

A few general statements, by way of summary:

1. Trailing raspberry is not too particular about soil fertility and will grow on a wide range of soils east of the 24-inch rainfall line.

2. Initial plantings require some form of cultivation for at least 2 years in order to compete with other vegetation.

3. The plant is moderately shade-tolerant and will grow underneath and along the edges of tree and shrub rows.

4. Established plantings provide excellent ground cover and are especially useful in wildlife areas in providing nesting and feeding places for birds and small game.

5. The fruit is of acceptable quality and is suitable for making pie, jelly, jam, tarts, and fresh dessert.

6. The plant is quite resistant to bramble diseases and is not greatly damaged by insects and rodents.

7. New plants may be obtained from seed or from cane tips covered with soil in midsummer.

8. Old plantings, if renovated, may regain vigor and fruit production. Renovation is accomplished by cutting out old canes, thinning plants, applying fertilizer if needed, and frequent tillage after plowing between rows, up to the time canes start rooting.

It is entirely possible that natural segregation or local adaptation may occur over a period of years to add strains that may have wider adaptability than the present strains. This would be desirable, since the performance of trailing raspberry indicates that it could well be used to a greater extent.

WATER covers but a relatively small fraction of the land surface of the North American continent—according to Paul Welch, about 2 percent. Yet, it exerts a tremendous influence for good or for bad on the land and on the future well-being of its people.

In this article, I set down some impressions of its paradoxical, man-induced influence for bad. I refer to the role of water in scouring misused lands, in transporting valuable loads of soil to the sea where recovery is minimal, and simultaneously decimating many valuable plant and animal communities which live in brooks, streams, creeks, rivers, harbors, bays, and coastal areas.

Lest we brush aside too lightly the extent of land erosion, recall for a moment the oft-quoted estimate that only one-third of the earth's surface is above sea level and that its mean elevation is less than one-half mile. Day by day these figures shrink. Why? Because about 3 billion metric tons of material from the land are being washed into the sea annually. Sir Cyril Fox ventures that if the ratio of erosion now taking place in the Mississippi River watershed were maintained world-wide the land surface of the globe would be lowered to sea level in about 60 million years.

Easier to visualize is the oft-quoted saying, and doubtless all too true, that the topsoil of one 40-acre farm goes down the Mississippi River past a given point every minute of the day and night. Of concern to the farmer is the estimate by the Kentucky agriculturists, McHargue and Peter, that the Mississippi removes annually from the land over 62 thousand tons of soluble phosphorus, in addition to around 7,500 million cubic feet of suspended matter that contains 0.15 percent phosphorus in combined form. These are staggering losses of our heritage that can not and should not be ignored. In the future every effort must be bent to understand and correct the causes of these wastes if we are to continue living well. William Feather has said, "About one-half the world's work is repairing mistakes." America has made its share of mistakes. To compensate for them is the big job ahead.

The waste of rich topsoil and valuable nutrients needed by the land is indeed great. But it is felt by others than the farmer. The arteries of silt transport are the brooks, streams, creeks, and rivers upon which millions of sport fishermen depend for recreation. Erosion silt can ruin the produc-

WATER WEALTH LOST BY SILT POLLUTION

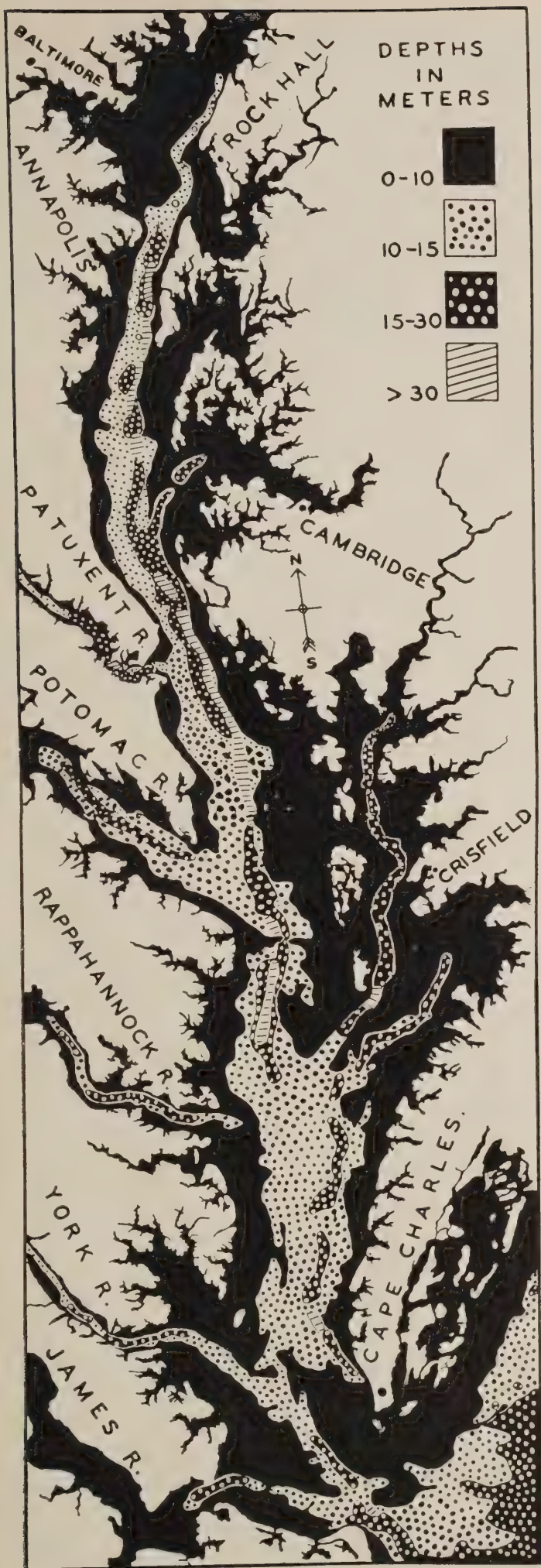
By CURTIS L. NEWCOMBE

tivity of a trout stream by removing fish food or it can destroy spawning grounds of salmon by submerging the gravel beds. Thus, the commercial as well as the sports fisherman has a stake in clean water. Over 15 million sport fishermen use the waters of this Nation every year. If we assume their individual expenditures for this type of recreation to be \$60, we have an annual total of almost a billion dollars. In California alone, with a population of a little over 10 million, there were in 1949 about a million licensed anglers whose annual expenditures for fishing probably totaled over 60 million dollars.

At a time when industries are polluting our streams, rivers, bays, and harbors, when the recreational facilities of our rapidly expanding population are inadequate and overcrowded, we are apt to overlook silt as it makes insidious inroads on the productivity of our rivers and streams, lakes and reservoirs—nature's hubs around which revolve the recreational activities of millions of Americans. *It is time to wake up to the facts about mistreated water.*

Silt, as a destroyer of the animal environment and hence of animal populations, first caught my attention in the Bay of Fundy off the Gulf of Maine. There the zone between the high- and low-tide marks is exceedingly great. It may be as little as 50 feet or as great as 1 mile or more, depending on the slope of the shore. The tidal amplitude, one of the greatest in the world, ranges from about 25 feet to over 50 feet. Everything, living as well as dead matter, appears to be stratified or zoned, and that goes for grades of stones, gravel, sand, and mud. Horizontal bands of plants and animals line the picturesque, rugged, and colorful shoreline for

Note.—The author is biologist of the California and Great Basin Drainage Basins Office in the United States Public Health Service, San Francisco 2, Calif.



miles. The black layer of sea mussels adjoins the glistening white specks of acorn barnacles that pepper every exposed, but hard, surface. Lower down, where the proportions of mud and sand are about equal, appears to be the optimum habitat for the subsurface, soft-shell clam. The clam connects with the surface by means of a retractile, muscular neck with incurrent and excurrent canals for drawing in and expelling food-bearing waters. Still lower down in quiet coves the clam was singularly absent although elsewhere abundant and growing normally. An analysis of the environmental factors showed the *limiting factor* to be a surface layer of silt sufficient to smother an entire adult population of these bivalves. The silt had washed in from the land and developed a delta fan of encroachment upon an otherwise balanced community of clams, soil, and water. Particles of silt had smothered the clams, stifled their breathing tissues and choked off circulation, spelling death to a subterranean population of nutritious marine animals that have made New England clambakes famous.

Silt may limit the distribution and abundance of a population in devious ways. The surface-dwelling Virginia oyster of Chesapeake Bay affords another example. There, free-floating larval oysters of microscopic size develop to a settling-down stage when they are ready to attach to a clean, hard surface. This is the weak link in the chain of successful oyster culture. Without clean, hard surfaces such as oyster shells the larvae soon die. The attachment materials are known as "culch." In colonial times the waters of the Chesapeake were relatively clear, as testified by the early writings. Great oyster bars extended up and down the bay and formed numerous elevations above the bottom that, in the James River, appeared at low tide as small islands above the surface. Oldsters in the oyster industry today still remember some of them. But why have they seemingly sunk? It is not alone because of the silt factor.

Here, and in numerous other parts of the bay, the story is the same: Overfishing on the bars (i.e., a faster removal than can be compensated for by nature), depletion, disuse of the bars, and, then, the accumulation of a silt load even too great to overcome economically by artificial planting of culch or by other modern cultural operations.

Chesapeake Bay's large shallow areas in black bespeak the volume of "sullage from the plough."

Fouling of the needed attachment surfaces by silt has gone too far. Thus, there is terminated the life of an oyster bar (or "rock" as they are known locally) built up slowly through long periods of geologic time.

One asks, *Has the amount of silt in Chesapeake waters increased since Colonial times and, if so, why?* There is evidence that soil erosion assumed startling proportions at an early date. Tatham wrote about the silting up of rivers in his *Essay on Tobacco*, dated 1800: "... the constant sillage from the plough, and other washings of the upland counties, have impeded the navigation, . . . but particularly James' River, where the channel is subject of frequent changes."

L. C. Gottschalk has accumulated convincing evidence to show a conspicuous increase, especially within recent decades. He estimates that over 85 million cubic yards of sediment were deposited at the head of the bay alone between 1846 and 1938. Foundations of Colonial towns laid out adjacent to deep water for purposes of water transport are now as far inland as 1 or 2 miles. The cause lies in the familiar story of misuse of the land—in this case, rapid deforestation of the coastal plain by the tobacco planters of the Colonial period. They started the march of soil to Chesapeake Bay and as yet it has not been stopped.

Let us leave the Atlantic coast with its washed-out, defertilized tobacco lands to explore the ways of silt and of men on the western fringe of the North American continent. Turn to the expansive State of California and inland to the once-beautiful streams of the Central Valley that drain the western slopes of the Sierra Nevada Mountains. There was a time when stream banks, protected by deeply rooted plants and fringed with emergent vegetation and healthy shade in a tempting habitat niche, were in balance. The waters were clear and crystalline. What do we find today? Great gravel piles may offer the most conspicuous greeting. In parts strangely barren, they have remained thus for decades, so successful has been the defacement of nature's alpine beauty and the wholesale gouging of her stream beds. *It took but the business of a few to destroy the priceless heritage of a nation.*

These were also pioneer days. Gold meant to California what tobacco meant to Virginia. Brigades of miners swarmed to the rivers, and the

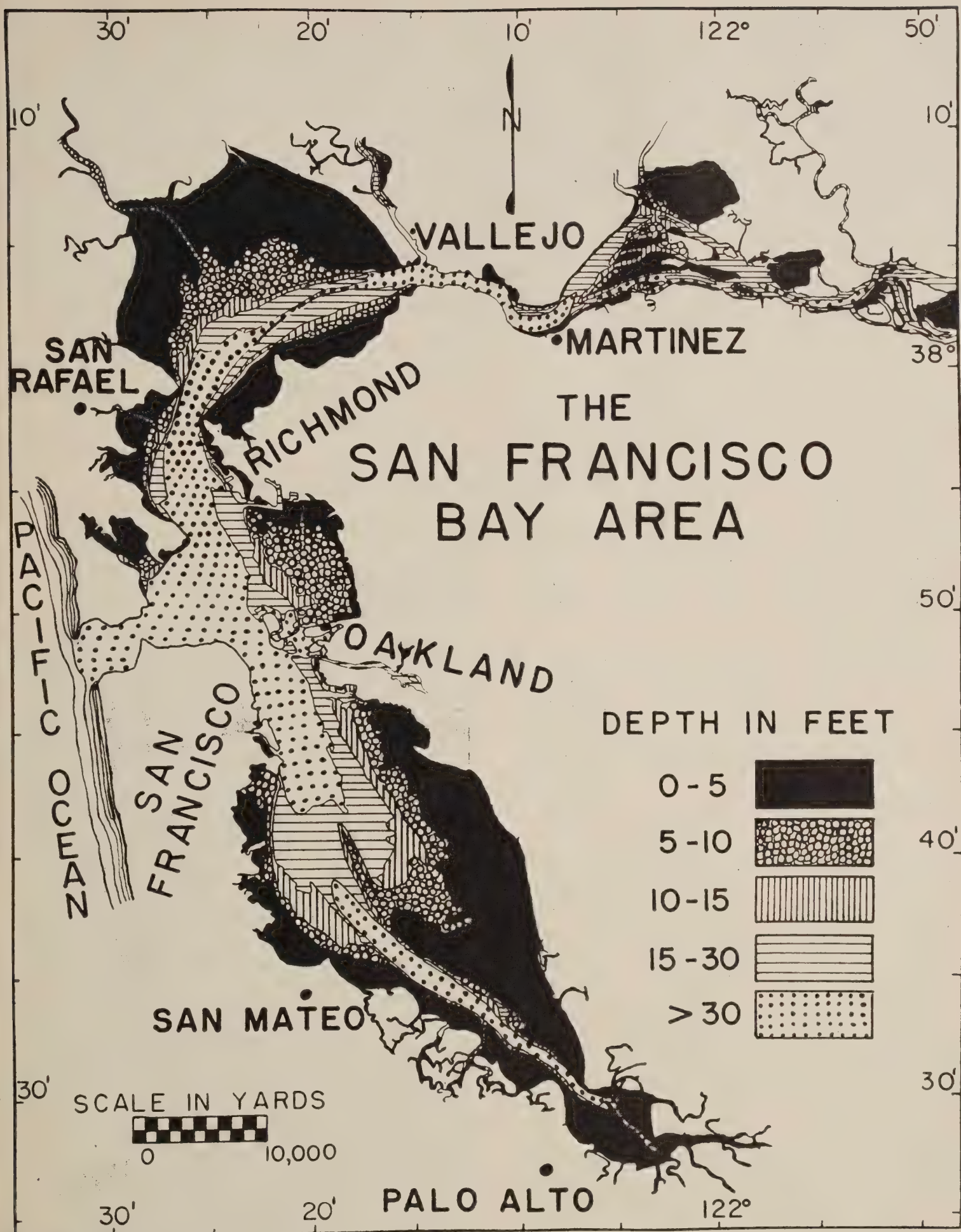
eruption, destruction, and migration of soil began. One will probably never truly know the immensity of the catastrophe spelled out during that reckless and improvident era. The erosion silt has reached San Francisco Bay; in what quantity no one rightly knows. The bathymetric picture accompanying this article is strongly suggestive. *Over 40 percent of the bay area lies under less than 5 feet of water.* Here the oyster is but a memory. No one will dispute the destructive role played by silt, along with domestic and industrial wastes, in cutting down the capacity of the bay waters to produce nutritious shellfish, as well as fin fish.

Elsewhere in California the transformations of landscape may be less dramatic but all bear the scars of human greed and wanton profligacy. Early settlers in the Salinas Valley described the San Antonio River bed as being narrow and well-defined, with bordering groups of cottonwood trees when foliage sometimes met above the streams. By 1905 the watercourses were broad flats of sand, gravel, and boulders, often a quarter of a mile in width.

But the biological implications of such transfiguration of habitat are not always visible at the surface. Erosion silt may attack fish directly by destroying the spawning beds, as in the case of salmon. These beds consist of a gravel bottom covered by shallow, clear, cool, flowing water. Such beds were common in the rivers of the Central Valley. They were the destination of great up-river runs of Chinooks. Biologists now strive for the protection of the remaining beds that have survived the passage of time with the multiplicity of dams, irrigation facilities, hydraulic mining dredges, and other transformers of nature spawned by man.

The basic element of productivity in water is the plankton—microscopic plants and animals—at one end of the food chain. *When silt enters a stream, look for a rapid exit of plankton.* Silt draws the curtain against light, and the growth of free-floating, microscopic plants declines. Those living on the stones and rock surfaces in the stream beds likewise succumb to the shades of night imposed by an invading blanket of silt. Thus, the all-important link in the food chain is severed. Bottom-dwelling, immature stages of insects such as May-flies, stone-flies, caddice-flies, and crane flies decrease in numbers. In short, fish food suffers and is reflected in

(Continued on page 278)



Extensive shallow, silt-laden areas of San Francisco Bay tell a dramatic story of man's waste of natural resources.

HARRY CAPPS OF WALSENBURG

By MILTON MANGUM

DROUGHT in the short-grass country anywhere from the Rio Grande to the Canadian border means more mail for Harry Capps. Wearied cowmen in far places know that if there's grass anywhere it will be on the Capps place. And so the pathetic appeals pour in on "the Old Man of the Mountain" at his grassy retreat in the wilderness overlooking the town of Walsenburg, Colo.

"If I could just squeeze in a few carloads . . ."

"I'm desperate. My grass and water's gone . . ."

Many cowmen drive in, with dust-caked fenders and vivid pictures of distressed conditions on their ranges. They try bargaining, pleading, and other means of persuasion. But neither love, nor money, nor cuss words—nor that strongest appeal of all, the desire to help another cowman in distress—would ever persuade Harry Capps to open his gates to another "critter" when his range is stocked; stocked, that is, with a wide margin in favor of grass and browse.

His is a shared life. If it will help the home folks he's for it. And by being for it he means more than an affirmative nod. When Capps is for something, he's for it with all the punch of a trained fighter, but a trained fighter with a sense of humor.

When the fight was on at a recent cattlemen's convention to determine whether the next meeting would be held at Colorado Springs or at Walsenburg, Capps was in there doing all he could to swing the votes to his home town. When he was asked about the supply of beds, Capps replied, "Beds? Who's worried about beds? The convention's only going to last 4 nights."

Catching a cattle rustler gave him his start in ranching. His \$300 reward paid for his first eight head of foundation stock. His tenacious belief in grass, backed up by constant effort to do better, has enabled him to develop range land that harks back to the days of Coronado.

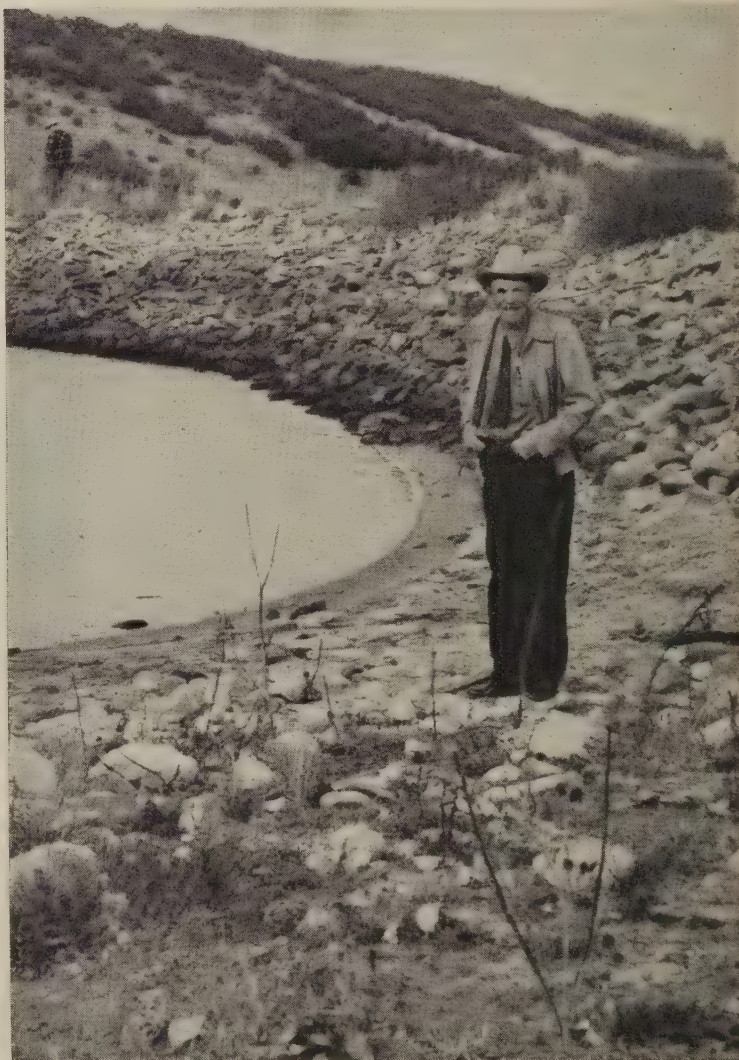
The 42,000-acre Capps ranch sprawls contentedly at the foot of the Spanish Peaks in southern Colorado. Here, fat grass spreads its lush carpet from

way up on the bench where tall ponderosas gather in congenial groups on down to the breaks where the scrub oak begins to peter out.

Like a giant piece from a jigsaw puzzle, the Capps ranch stands out in bold contrast to its surroundings. Here is range land better than before the white man came. Here lives again the sea of waving grass pictured in the diaries of those who traveled westward a hundred years ago.

The grass on Harry Capps' ranch is better because he has followed four basic principles of range-land management:

1. Livestock numbers are kept well within the limits of the feed the range provides.
2. Grazing is adjusted to meet the growth requirements of the grass.
3. Stockwater facilities, salt, and fences are located where they make the best use of the range.



Harry J. Capps at the edge of one of his stockwater dams.

Note.—The author is in the Production and Marketing Administration, Washington, D. C.



Healed gully on the Harry J. Capps ranch.

4. His stock is the kind that makes the most economical use of the grass available.

Capps really believes in grass. To him its tender blades in spring and summer or its golden stalks in fall and winter are the panacea for whatever may ail a man—his livestock or his land. His is no “hokus-pokus,” “mumbo-jumbo” faith in mystical curative properties, but the hard-bitten experience of a lifetime.

He has learned that to have enough grass in the lean years you can't graze it down to root-tops in the long years. He has seen many a stockman go under because he had more cattle than feed; few, if any, because they had too much feed.

He follows a simple rule in buying and selling livestock: “Buy when the other fellow wants to sell. Sell when the other fellow wants to buy.”

All too often the reason the “other fellow” wants to sell is shortage of feed. Capps makes sure there is enough. He keeps his livestock numbers within that limit.

To Harry Capps, conservation is simply using his range so that he and those who come after him can go on using it with no reduction in the amount of feed. If all the libraries on conservation were destroyed, the simple essentials of soil building would survive on the Capps ranch. The gullies which once bled the life from this land have healed over. The soil is growing fat on the grass which goes back to it each year. Even the rain seems to fall more abundantly and more frequently on this place.

Truckers, driving through the Capps ranch on the way to a construction job up toward the Spanish Peaks, often complain of the mud in the road through the ranch. Just outside the fence the road is dry and hard.

Although it may seem that he is able to “fence in” the rain, Capps knows that a good sod holds the moisture. The grass blades break the fall of the raindrops and slow down the runoff. The spongy network of roots and decaying plants soaks up the water and holds it in the soil for future needs.

Capps has learned all this, and more, from observing what was going on around him. He has found that a good range cannot be maintained when the grass is eaten to the ground. A part of the grass has to be returned to the soil each year to keep up the organic matter and the fertility. In the blades of grass the food is made to sustain the plant. If the blades are eaten off too early in the spring or too short in the summer, there is little reserve food stored in the roots and the plants are easily killed. Plenty of water backed up by earthen dams helps him get the full use of his range.

He found out, too, what was killing his cattle in the spring when they moved to the higher benchland. The cattle died after a frost. They died where the oak leaves had been frosted. It was simply a matter of keeping the cattle off the oak leaves after a frost, turning them on again when the danger period had passed. He had no more losses from oak poisoning.

One significant departure from established order challenges visitors who like to lose themselves on the Capps acreage. His oak brush has never spread. It stays put, in timid, elegant clusters. On other ranges, the oak spreads as the grass weakens. Here the grass holds its own. And in spite of their poisonous propensities, Capps prizes the shrubs. They provide good forage, they catch the snow, they furnish shade, and besides all that they “just plain look good.”

Here and there, star-scattered over this immense block of land, patches of three awn grasses mark the spots where hopeful settlers of another day tried to make a stand for advancing civilization with eastern cropping plans. Slowly these scars are being erased.

When offered nearly half a million for the ranch, Capps' reply was typical: "I know what I can do with the ranch, but I wouldn't know what to do with that much money. Besides, I can have more fun with the ranch."

At one time he had almost decided to sell another piece of range land, but he turned down the offer when he learned the prospective buyer intended to plow up the land and put it into wheat. "I've seen too much land ruined that way and I've smelled too much dust."

But he has bought land to protect it—to keep it from being cut up by gullies and denuded of grass.

Capps has been chairman of the Huerfano County PMA committee for the past 10 or 12 years. He has served on the SCS board for a similar number of years. Although he has been carrying out most of the conservation practices needed on his place for years, he realizes that Nation-wide such programs as are encouraged under the Soil Conservation Service and the Agricultural Conservation Program are necessary to get the job done.

When his neighbors elect him year after year he accepts their confidence in his two-fisted way of carrying on the fight to save and build the land.

Back a few years ago, when prairie dogs were a serious menace to good range, Capps and the committeemen worked out a program requiring ranchers to get rid of them before they were eligible for assistance for any other conservation practice. There was no need trying to help a rancher improve his range with the prairie dogs wiping out all the benefits of seeding or better grazing. Today, they are gone.

The old home once served as post office, ranch headquarters, and social center—a good place to bring up eight children. Here couples came from miles around to dance to the music of fiddle and guitar.

It was to the local post office—known first as Scissors, then Santa Clara, and finally Capps—that young Harry carried mail from Walsenburg for \$1.50 a trip. And the trips had to be made, rain or snow.

The old home ranch of his father is a part of the present Harry J. Capps ranch. He's proud of that. But he's prouder that his son Samuel will be getting a ranch with grass as good as it ever was—probably better.

RESPONSIVE FIELD

(Continued from page 266)

was straightened and its banks were protected with riprap. A short piece of road and a bridge were built to give access to the field, which was seeded to reed canarygrass, alsike, and redtop in 1949. Cost of clearing, seeding, liming, and fertilizing was \$2,000, a net cost of \$1,650 or \$118 per acre, after deduction of pulpwood proceeds.

In June 1950 the first cutting from the field was about 140 tons of ensilage, the equivalent of 3 tons of hay per acre. A second cutting yielded another ton per acre, a total of 4 tons of hay equivalent per acre. At \$30 per ton this first year production was valued at \$1,680, more than the net cost of the whole job.

WATER WEALTH LOST

(Continued from page 274)

the angler's catch. A few bloodworms may exist in organic mud deposits, but generally silt spells decline to a sport fishery.

Erosion silt is an expensive neighbor. It affects deleteriously the use of water for domestic and industrial purposes, for commercial and sport fishing, for recreation, for esthetic improvement of the landscape; in fact, silt affects deleteriously all desirable water uses. By continuing to tolerate the conditions that feed it to our waters we are continuously decreasing our capital stock in land resources, not too great by any standard. That which is really fantastic is our by-passing and ignoring its influence on inland water resources that at best can only absorb unavoidable pollutants from a highly industrialized community of mechanized human beings. We are spending and idly watching our endowment dwindle—soon to arrive at a "hard times" economy. It is later than you think.

KUDZU-23—

A NEW FINE-TEXTURED VARIETY

By R. L. DAVIS and W. C. YOUNG

MANY people think that all kudzu plants are alike, but there are probably as many different varieties of kudzu as there are varieties of corn. They are not known because nobody has taken the trouble to separate them. Kudzu plants differ as to shape of leaf, size of stem, number of leaves, number of stems, length of joints, ability of the joints to root, and in other ways. Since all the crowns grown from one plant will make an identical type of growth, it is easy to have a new variety.

Such a new variety of kudzu is being distributed by the nursery division of the Soil Conservation Service in Region 2. It is called kudzu-23. It was developed by propagating from a single drought-



Leaves of common kudzu.

resistant plant found on an eroded clay hillside near Watkinsville, Ga. Since the original crowns came from one mother plant, all the growth in a field of kudzu-23 has the same characteristics. These are a fine-textured foliage with numerous small stems and small, almost-round leaflets. On the other hand, a field of common kudzu has coarse-textured foliage. Such a field is a mixture of many plants, with large and small leaves, but most of them with large and deeply scalloped leaves and coarse stems.

Kudzu-23 represents an improvement in quality rather than forage yields. Stock will not eat the coarse stems of common kudzu, but they will eat all



Leaves of kudzu-23. This is the original plant found in Georgia in 1941.

of the fine-textured kudzu-23 hay. The stems of kudzu-23 are seldom as thick as a lead pencil and, in general, are only about half to one-third as large as those of other kudzu. Like other kudzu, it is very drought-resistant and will provide grazing during the late summer when other pastures are brown. The dark green color and extra thickness of kudzu-23's leaves make for extra drought resistance.

Kudzu-23 has distinct qualities which give it soil conservation value. It covers the ground rapidly. It establishes itself as it spreads. It makes an unusually dense ground cover. Observations for a number of years show that kudzu-23 has about twice as many runners as common kudzu. It, therefore, has more joints and the joints root more readily. Complete ground coverage has been secured in 2 years' time. Kudzu usually requires 3 years. Each of the many rooted joints forms a new growth center. That is why kudzu-23 covers the ground so rapidly. Its many rooted joints later develop into crowns more numerous than those of common kudzu. Better protection against erosion, also, is afforded from its more numerous leaves, which form an unusually dense cover and give a dense litter.

Because of its numerous crowns, kudzu-23 is superior to other kudzu as a source of planting material on the farm. Hand-digging of kudzu-23 on plots has shown it to yield considerably more crowns than common kudzu—as much as 87,000 crowns per

Note.—The authors are management agronomist and nursery manager, respectively, Soil Conservation Service, Thorsby, Ala.

acre, compared with 50,000 per acre for common kudzu. On 4 acres, mechanically dug in 1950, kudzu-23 yielded 50,000 crowns per acre. Yields of common kudzu dug with plows usually run about 35,000 crowns per acre. The propagation of kudzu-23 from crowns should, therefore, be relatively cheap. This difference in yield of crowns is important because kudzu-23 will not remain uniform if propagated from seed. It will lose its identity unless propagated from crowns.

Yields of forage are about the same as for common kudzu. Utilization by livestock is better and, if handled as hay, operations are somewhat easier.

The growing of kudzu-23 is the same as that of common kudzu. Good cultivation must be given the first 2 years and the stand must be fertilized.

Limited numbers of crowns are available each spring by request through normal SCS channels. Plants are shipped from Thorsby, Ala. Those crowns now in the hands of the field service should soon form the bulk of the material for further increase and distribution.



Stems of common kudzu.



Stems of kudzu-23.

STRIKING INCREASE IN 1 YEAR.—"Using the string-row method to lay off my tobacco rows was worth \$500 per acre to me last year," Bob Hobson, of Boonville, N. C., told Ned Hood, work unit conservationist in the Tri-Creek Soil Conservation District, at Yadkinville, N. C. The string-row method is a system of row lay-out for tobacco land which provides row drainage throughout the length of each row without ponding.

Hobson explained that as a part of his district program, guide rows were laid out on his tobacco land in 1950 because the previous rows did not have constant grade and his tobacco was being damaged by excess water during wet periods. "In 1949," he said, "tobacco on this land brought \$300 per acre. In 1950, tobacco produced on the same land with a similar season brought \$800 per acre."

MUCH IN A NAME.—James Ross, a cooperator of the Bracken County (Ky.) Soil Conservation District, is so proud of his terraces that he has named his farm "Terraced Hills Farm." The name is lettered on his mail box. District Conservationist D. W. Orcutt also reports that Ross is a magistrate, a neighbor-group leader, and a man of action in getting the conservation job done in his community.

TREES LIFT THE FORTUNES OF A PARISH FARM

By JIMMIE P. MAXWELL



FOLKS around Arcadia, La., used to call it the P-farm. They were referring to the 480-acre farm owned by Bienville Parish.

Now they call it the tree farm.

But let's look back almost 10 years.

The acreage, about 4 miles south of Arcadia, then was operated as a general penal farm. Early in 1941, for example, when the parish police jury became a cooperator with the Saline Soil Conservation District, the parish-owned tract was carrying 35 head of cattle, 8 mules, 30 hogs, and 50 chickens.

Seventy-eight acres were planted to cotton, ninety-one acres to corn, and thirty acres to potatoes, sugarcane, soybeans, and peas. One hundred and fifty acres were in pasture and one hundred and thirty-one acres in woodland.

Though the police jury employed a paid manager

Note.—The author is work unit conservationist, Soil Conservation Service, Gibsland, La.

and had the advantage of a free labor force from the parish jail, the farm was a headache. It lost about \$2,000 in 1942—the last year it was operated as a cultivated farm. The police jury retained ownership but temporarily abandoned any effort to work it. Meanwhile, there was considerable natural reseeding to pine trees. Because of their remoteness from trees, however, the steep, eroded slopes—where protective cover was needed most—had not reseeded.

More trees, the Soil Conservation Service suggested, would ease erosion and improve the chances of putting the land on a paying basis. Police jury members liked the idea. So 50,000 slash and loblolly pine seedlings were set out during the 1948-49 planting season.

SCS helped, too, by marking for selective cutting 100 acres of older woodland on the farm. Proper cutting, it was noted, would not only yield cold cash but, more important, would assure the remaining trees proper growing space and actually mean an improved timber stand which would command higher prices.

The trees in the selectively marked area sold on bid last fall for \$2,750. The take included over 44,000 board feet of gum and over 39,000 board feet of pine. The rest of the cut was oak and other hardwoods. Follow-up cuts will be made on this tract at 5-year intervals.

Heartened by the sizable return and the improving condition of the land, the 10-member police jury voted last year to turn the entire acreage into a tree farm. They even had a big highway sign painted to mark it as such, and held a formal dedication ceremony the past February.



Crews like this one recently have planted more than 125,000 pine seedlings on the tree farm.

An additional 75,000 pine seedlings, obtained through the Saline Soil Conservation District, were planted during the 1950-51 planting season. The little trees will be ready for pulpwood thinnings in 12 to 15 years.

Police jury members are working toward a minimum yield of 500 board feet per acre per year when the entire woodland reaches a high productive level some 25 or 30 years from now. Properly managed, it then should yield \$5,000 a year to Bienville Parish.

President Winlock Van Cleave, Gibsland, points out a more immediate return: "The more trees we grow, the better our soil becomes." He's hopeful that the tree farm will inspire others in the area to more scientific use of woodlands.

Other police jury members are Raymond Madden and Leslie Brewton, Arcadia; Steve Collinsworth, Bryceland; Buck Poole and Dallas Smitherman, Bienville; R. D. Conly, Ringgold; Dave Spinks, Jamestown; Carl Knotts, Castor; and Tom C. Rogers, Saline.

SHORT CUT TO LAND MEASUREMENT

By BERNHARD A. ROTH

TO PLAN food and fiber production, American agriculture must take inventory. Its basic stock-in-trade is represented by 1 $\frac{1}{4}$ billion acres of farm land.

Complicating the inventory is the fact that not all land is alike. Hundreds of soil types, varying degrees of slope and erosion, plus climatic and human factors, are involved.

An area mapped by Soil Conservation Service surveyors may show as many as 200,000 separate land parcels. The surface of each has to be measured to obtain a complete and accurate accounting.

Orthodox methods of measurement often are exceedingly slow. The two most common techniques

involve use of the grid and the planimeter. In one case, the transparent grid is laid over a map of the problem area. By counting squares and interpolation, areas of the parcels can be computed. In the other case, the planimeter's stylus is run completely around the perimeter of each mapped plot and the area read from an indicator. Both methods require separate calculation and tabulation for every one of the multitudinous land parcels.

An improved technique has been devised by the Soil Conservation Service to eliminate the numerous, individual steps. The basic idea is that *map weight* of a piece of land of *known* area will help determine the unknown areas on maps of similar scale and paper composition.

Stated simply, an acre of land on one map should "weigh" the same as an acre on another map. Simple division of the unknown parcel's weight by the known weight-per-acre reveals the problem acreage.

Here is how the idea actually works: Soil conservation surveys are plotted on photo-maps of standard scale. Using sharp instruments, cartographic aids cut out all the many land parcels, jigsaw puzzle fashion. All parcels representing similar kinds of land are segregated in envelopes.

Contents of each envelope are weighed on fine analytical balances. From the known weight per unit factor, the total area of similar parcels is determined by one simple calculation. One recording



Areas from soil-survey charts are superimposed on photomaps and cut into thousands of irregularly shaped portions as a step toward estimating acreages.

Note.—The author is information and editorial specialist, Soil Conservation Service, Upper Darby, Pa.



From established weight factors, the total area of all similar land parcels can be quickly estimated—a method developed by the Soil Conservation Service which has saved thousands of dollars.

often replaces dozens or more. The result is time saved, and reduced possibilities for error.

The technique—known as “weight apportioning”—requires control. Adjustments are made for variations in paper manufacture and weight. Other compensations neutralize minor aberrations of scale in aerial photo-maps, and differences in topography. Nevertheless, spot checks by grids and planimeters prove the newer method keeps within a 1-percent margin of accuracy.

Thousands of dollars have been saved by this ingenuity in area determination, and American agriculture now gets a faster stock taking of its chief resource.

CONSERVATION ON HIS MIND

By ROY L. HAUGER

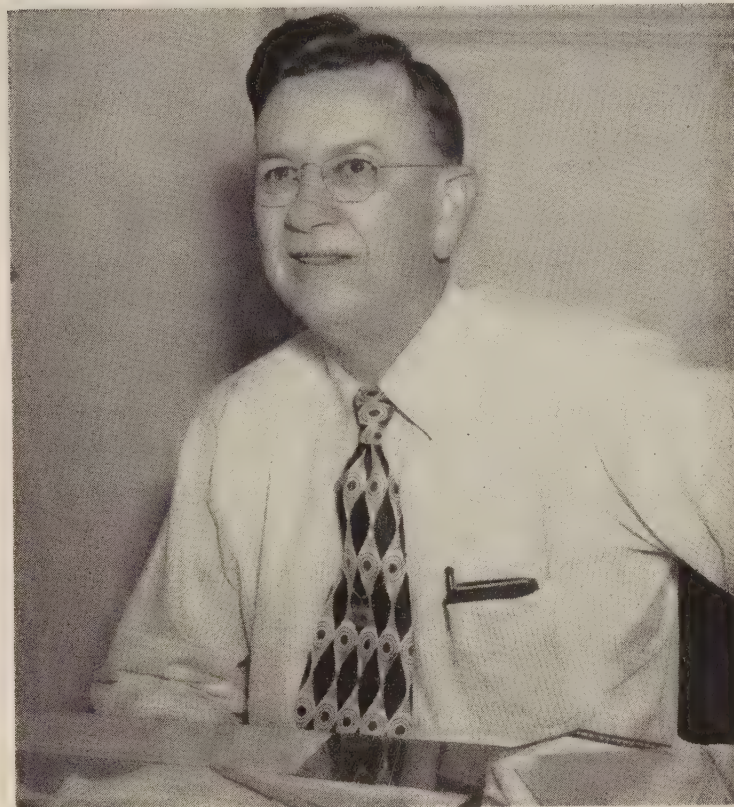
J. E. JUNKER of Rosenberg, Tex., is a conservation-minded farmer, landlord, and banker. He has three tenants on his two farms and they, too, think in conservation terms. Junker and tenants

Note.—The author is district conservationist, Soil Conservation Service, Rosenberg, Tex.

together farm 379 acres. Every year under conservation they increase crop yields. Every year the soil and grass improve.

“When soil and grass improve, crop yields and pounds of beef per acre increase. We made 50 bales of cotton on 62 acres last year, whereas we made only 42 bales on 148 acres in 1945 when we didn’t know much about the work of soil conservation districts and were just getting started on our conservation plan,” Junker noted.

George Hausler, Oscar B. Roesner, Jr., and Edwin Heckmann are tenants who take pride in the land they till. At first, however, they were doubt-



J. E. Junker.

ful about the value of the conservation plan, so Junker bought each enough superphosphate and Dixie wonder peas to cover 10 acres. The tenants applied the fertilizer, grew the peas, and turned them under to improve the structure and composition of the soil. In 1947 they increased their cotton yield to 66 bales on 128 acres.

Late in 1947 some of the planned drainage work was completed and 20 more acres were planted to winter peas after superphosphate was applied. In 1948 the cotton yield increased to 74 bales on 128 acres. That fall 40 acres were treated with superphosphate and planted to winter peas. In 1949 the tenants harvested 88 bales of cotton on 128 acres.



Hauger and Junker do a little checking up on corn and dwarf milo maize.

Junker completed the drainage system in 1949, and 40 more acres were planted to winter peas after the application of superphosphate. The 50 bales of cotton from 62 acres planted in 1950 represented an increase of 186 percent in per-acre yield in 5 years of conservation farming.

Junker also likes to compare the differences in maize yields. Where no conservation work was done, the land produced 1,450 pounds per acre; but where the maize followed winter peas that had been fertilized with superphosphate, the yield was 2,600 pounds per acre.

Before conservation work was started, corn averaged 25 bushels an acre; last year the yield was 40—a 60-percent gain.

Junker is a typical conservation banker. He understands the many problems of the farmers and ranchers of the Coastal Plains Soil Conservation District. In 27 years of banking in Rosenberg, he says, he has had to foreclose only three loans, none of them farm loans. Farmers and ranchers have complete confidence in Junker as president of the First National Bank and as an adviser on agriculture.

Junker is one of those outstanding public servants found in every soil conservation district. He has served on all kinds of farm and civic organization projects and committees as a leader or a working committeeman.

Junker has headed the Coastal Plains Soil Conservation District as chairman of the board of

supervisors since 1943. He helped organize the district, then directed its development during the war years. After World War II he sparked creation of the Fort Bend County Drainage District, which was organized to finance and construct drainage outlets needed in the soil conservation district. Such outlets enable individual farmers to complete the drainage of their land.

“When we get our district drainage work completed,” Junker says, “and our farmers and ranchers carry out their conservation plans, we’ll increase agricultural income in the district \$4,000,000 a year.”

CHANGING THE APPROACH

By KENNETH WELTON

EARLY in our neighbor-group work we ran into difficulties in switching from the *individual* approach in farm conservation planning to the new *neighbor-group* approach.

A number of districts had 100 or more active applications for farm planning on file, and the district board could not agree to obligating the services of the SCS planner to any new applicants until those on the lists were serviced.

Note.—The author is State conservationist, Soil Conservation Service, Lafayette, Ind.

Some of those working on the techniques of neighbor-group work proposed that the applicants be separated into neighborhoods so that they might be serviced as neighbor groups instead of individuals. However, the early attempts at doing this showed that only a small percentage of the applicants fitted into neighborhoods. On the supposition that each of 100 farmer applicants belonged to some neighborhood and all of the neighborhoods were traced out, 80 or more neighborhoods would be revealed with an average of 7 farmers in each. Hence, there were 560 potential applicants for farm planning instead of 100.

With this in mind, we suggested a system to one of the districts with which we were working which has been tested by several Indiana districts with more or less satisfactory results.

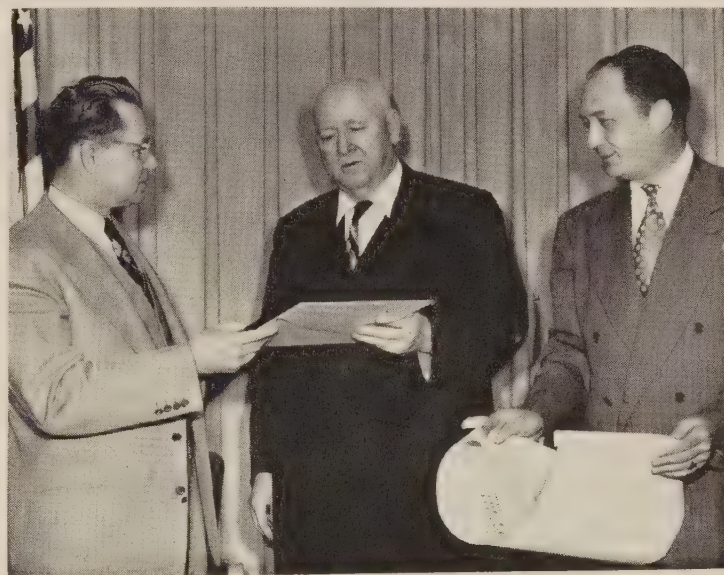
The location of each applicant is marked on a district map. Usually it is found that there are concentrations of applications and it is usually a simple matter to draw a circle around artificial groups of up to 25 applicants. One or two groups may have to be composed of a more scattered pattern of applicants but usually the districts have been handled in from four to six artificial groups.

A letter from the board of supervisors is then sent to each farmer in the first artificial group selected for planning. The letter explains that, due to the increasing popularity of the district program and the shortage of trained planning assistance from the Soil Conservation Service, many farmers are having to wait a year or more for assistance, and that it is the policy of the district to give assistance through a conservation farm plan, including a conservation survey. It also states that the board is convinced that a great deal of time could be saved if farmers would attend a series of meetings with SCS technicians to discuss soil conservation problems and solutions, and that after such meetings appointments would be made for individual on-the-farm assistance. The letter invites the farmer to meet at a certain time and place with a group. The applicant is urged to attend, since this may be the only opportunity he will have for some time to receive the assistance he requested.

Our experience has shown that about 60 percent of the applicants thus circularized attend the meetings. Thus, 40 percent of the applicants are eliminated because they are not sufficiently interested. The supervisors feel that they have no further immediate obligation to this group that thus has elim-

inated itself. Of those who attend, usually 55 percent to 65 percent, or more, complete a plan in the scheduled time. Those that do not are considered, for the time being, to have been serviced.

In one district there were about 120 applications for district assistance on hand. In 1 year, through this system, the slate was cleaned and the district had between 50 and 60 additional good farm conservation plans. In this case, however, the problem was not completely eliminated because the district continued to accept new applications from individuals, so that by the time the 120 applicants were cleaned up there was a new list of over 50. Districts that have since used this scheme, however, have accepted applications only on a neighbor-group basis except in unusual cases. Farmers coming in during the period the plan is in operation are questioned concerning their neighborhoods and given no promises. When the planner finally turns to the neighbor-group method, he has a good start toward locating and lining up neighborhoods.



The Honorable Knox T. Hutchinson, Assistant Secretary of Agriculture, presents award to Hugh H. Bennett, Chief of the Soil Conservation Service. Looking on is Gordon K. Zimmerman, who was responsible for the concept of "Water for a Nation" and for the writing of the script.

Of 76 American films submitted at the International Film Festival at Edinburgh, only 11 were among the selections for public exhibition throughout the world.

One of these was "Water for a Nation."

"Water for a Nation" is a 2-reel production by the Soil Conservation Service in both 16 mm. and 35 mm. It is a black-and-white sound film, released in 1949, which takes 20 minutes. It carries excellent photography, effective narration, and an original music score. The film shows that conservation farming helps to keep the water in the soil where it falls as rain or snow, thus preventing runoff and flood; and in arid country is a means of utilizing every drop of available water.

LONG GREEN CARPET THROUGH THE WOODS

By O. O. MOORE

A 23-mile-long, 100-foot-wide swath of grass in the pine-clad hills of Louisiana stands today as a tribute to cooperative enterprise and proper use and treatment of the Nation's land resources.

Its beginnings date from World War II when the Louisiana Power & Light Co., faced with the necessity of serving Army camps and expanding industry, constructed a high-voltage transmission line across parts of Sabine, Natchitoches, and Winn Parishes.

The 100-foot right-of-way was cut from heavily wooded hills and tangled creek bottoms. Trees and brush were cleared out as quickly as possible. After the line's completion in 1942, the company faced the task of keeping it clear of sprouts and bushes.

In mid-1949 the company bulldozed the entire right-of-way to end the bothersome growths. This permitted mowing by tractor-powered machines, and lowered maintenance cost.

But a new trouble—the effect of hard rains on unprotected soil—came the following winter and spring. Large quantities of topsoil had been pushed aside during the bulldozing and blasting operations. Large areas lay bare, no longer protected by forest litter.

The result was inevitable. As rain after rain fell on the rugged hills and long rolling slopes, more soil washed away. Gullies formed, deepened, and lengthened and promised eventually to undermine the poles supporting the high-voltage lines.

After inspecting the problem area, company officials took the matter to Soil Conservation Service technicians at Winnfield, La., then to the Dugdemona Soil Conservation District.

A survey of conditions revealed the factors influencing erosion and the kind and amount of treatment needed to control it. The study showed that more than 16½ miles of the 23-mile-long strip were being moderately or severely eroded. Plans were made to treat each section of the right-of-way according to its hazards and its needs.



Vegetation takes hold on the right-of-way after fertilizing and seeding.

The big job, done by private contractor, began last September. The more critical areas were treated first. SCS technicians supervised the work and ran diversion terrace lines on areas where it was considered essential to establish a good grass cover.

The tractor and terracing plow, owned and operated by the district, built the terraces. Smoothing and filling of large gullies, seeding of ryegrass and Singletary peas, and fertilizing to maintain a vigorous protective cover were important parts of the job.

The coordinated conservation program has blunted the erosion dangers. And it has done so despite heavy grazing by range cattle and hogs which have concentrated on the lush green forage.

The project is one more bit of evidence that people are beginning to recognize that "with the right to use goes the duty to conserve" and that industry and soil conservation districts benefit from working together.

SPREADING A BLANKET. — Farmers in the Cheatham County (Tenn.) Soil Conservation District lacked only 3 acres of getting all cover cropping planned through 1950 applied on the land, the annual report of the board of supervisors shows. Of the 3,648 acres planned for this practice, 3,645 acres had been applied at the end of the year.

Note.—The author is district conservationist, Soil Conservation Service, Winnfield, La.

REVIEWS

WATER—OR YOUR LIFE. By Arthur H. Carhart. 312 pp. 1951. Philadelphia, Pa.: J. B. Lippincott Co. \$3.50.

"Water—Or Your Life" does an effective job of putting the Nation's water problems in focus. It combines the best techniques of pulp fiction with an amazingly extensive web of facts. Of many recent books on "popular" conservation, it may prove one of the most successful.

Carhart's searching observations may awaken spectres of water conservation in many American homes. His correlation (of water—or your life) extends to the loaf of bread on the table and gasoline in the family car. So soundly does he develop his thesis that professional conservationist and layman alike may conclude—"It's much later than we think."

Arthur H. Carhart, the book's author, is a prominent figure in the conservation and out-of-doors field. In World War I, he was an Army medical-corps officer in charge of water sanitation. He was subsequently a member of the Forest Service and, later, a director of wildlife restoration funds for the Colorado Fish and Game Commission. He lectures widely and has often been conservation's protagonist in public debates involving the country's natural resources.

As seen in "Water—Or Your Life," Carhart is at his best jabbing at apathetic attitudes. Water sore spots and enigmas in Texas City, Los Angeles, Atlantic City, and New York do not seem remote when he drives home their potential far-reaching effects on pocketbooks, health, and ways of life elsewhere in the land. Even when the book toys with highly explosive irrigation matters of the far West, the most hide-bound Main Streeter feels uneasily concerned.

From his numerous, unfavorable appraisals of them, it is obvious that the author is no exponent of "big projects" in formal conservation programs. His criticism of what he calls "super-engineering" works and proposals is, however, tempered with contrasting examples of their occasional necessity and value. The Yuma, Huntley, and Minidoka projects are treated in the latter vein.

In the main, "Water—Or Your Life" is sympathetic with the "upstream engineering" philoso-

phy of the Soil Conservation Service. With some reservations, it approves of practices which "may directly contribute to more sustained flow of water in streams feeding from ground reservoirs. And by helping to prevent floods, they may reduce the usefulness of flood control dams."

With a familiarity he has demonstrated in a number of magazine articles, Carhart devotes several chapters to problem areas of the West. There, he is able to describe in stormy detail the No Man's Land that still exists between conservationists and opposing factions. At this point alone, "Water—Or Your Life" will undoubtedly be damned or deified.

But whatever the point of view, most readers will agree that the new book performs several valuable services. It is a respectable critique of water conservation programs now existing; it offers standards for measuring others still in the proposal stage; and, with its careful index, it furnishes a ready reference to both ancient and modern history of water conservation in the United States.

—BERNHARD A. ROTH.

GOOD SCOUTS PLANT TREES.—Charles N. Hammarlund, Jr., an SCS aid since 1945, and scoutmaster of Troop 2 at Branford, New Haven County, Conn., for 3 years, has received the Hornaday National Court of Honor Award and a Gold Medal Badge for "distinguished service to conservation." He is the first in Quinnipiac Council, and the third in Connecticut, to receive this award.

Among the conservation jobs that the 45 boys did was to plant 20,000 trees on farms in the New Haven County Soil Conservation District.



Hammarlund and some of his Branford, Conn., Scouts.



PRETTY COUNTRY!—Not everyone flies his own plane, notwithstanding the impressive number of flying-farmer clubs. It is getting to be more and more fun looking down on the countryside, for contour farming has beauty as well as utility. And this beauty is of constant variety, a subject of immense popularity with the photographers. Rarely, however, does a picture-man show us what it's like to look down on this increasingly handsome farm land through the props and past the wheels of the plane in which he rides. Gordon S. Smith, however, does exactly that, in giving us this view of the farms of Christian Schmidt, Walter Seem, and Oscar Rosenberger, near Spinnerstown, Pa.

PUTTING LAND TO WORK.—On land that had previously grown only broomsedge and poverty-grass, Cyrus Cozart, in the Upper Ohio (W. Va.) Soil Conservation District, raised 112 bushels of shelled corn per acre in 1950. This is at least twice as much as the average per-acre yield in the county. The big change is the result of application of conservation practices, including contour planting and use of manure, lime, and fertilizers.

PROFITS GROW IN PASTURE. In 1945 when Art Twitchell started farming the conservation way at Mt. Upton, N. Y., under a complete farm plan made with the Chenango County Soil Conservation District, he had 90 acres of pasture land in two farms. He pastured young and dry stock on 57 acres, and milk cows on 33 acres at the home farm. Today, under his conservation plan, he pastures all 35 head on the 33 acres. It's ample because he has it in Ladino, orchardgrass, and birdsfoot trefoil. He limed and fertilized the native bluegrass and white clover. There is no running back and forth between pastures, because he is reforesting the 57 acres. Income from it will put his son through college.

Milk, dry, and young stock work around the rotated pasture, keep the rank growth down, and reduce the amount of mowing. The real payoff, however, is in the milk check. In 1950 the cows averaged 1,600 more pounds of milk per cow than they did in 1949. The gain was made during the pasture season. "More milk, no green feed to cut and haul, grain consumption down, larger milk checks—quite a jackpot!" Twitchell chortles.

